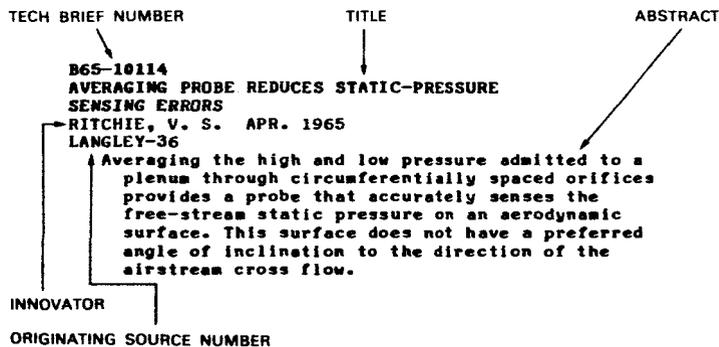


# Introduction

This *Cumulative Index to NASA Tech Briefs* lists the technological innovations published in this form during the period from 1963 through 1965. The main section is arranged in five categories: Electrical (including Electronic); Energy Sources; Materials (including Chemistry); Life Sciences; and Mechanical. A typical entry has these elements:



To help users locate information of value, three indexes are provided. The first is a subject index, arranged alphabetically:



Note that in this index several routes are opened for obtaining further information. If the title seems promising, the Tech Brief number and category may be used to locate the abstract, which will be found in the main section arranged sequentially by Tech Brief number

within each category. Further, the Tech Brief number can of course be used for obtaining a copy of the original Tech Brief.

The second index relates all items by the originating source and number to the Tech Brief number and category.

The third index relates all items by the Tech Brief number and category to the originating source and number.

Copies of all Tech Briefs cited in this Index are available on subscription or in single copy as follows:

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Annual subscriptions to Tech Briefs may be purchased from:

Clearinghouse for Federal Scientific and Technical Information  
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Attn: Code 410.14

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Other information on the availability of Tech Briefs may be obtained from:

TECHNOLOGY UTILIZATION DIVISION  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Washington, D.C. 20546

This *Cumulative Index* replaces the previous issues of the *Index to NASA Tech Briefs* which were published in January and August 1965.

## TABLE OF CONTENTS

<b>Category 01</b>	<b>Electrical (Electronic)</b> . . . . .	<b>1</b>
<b>Category 02</b>	<b>Energy sources</b> . . . . .	<b>18</b>
<b>Category 03</b>	<b>Materials (Chemistry)</b> . . . . .	<b>21</b>
<b>Category 04</b>	<b>Life Sciences</b> . . . . .	<b>27</b>
<b>Category 05</b>	<b>Mechanical</b> . . . . .	<b>27</b>
	<b>Subject Index</b> . . . . .	<b>I-1</b>
	<b>Originator/Tech Brief Number Index</b> . . . . .	<b>I-73</b>
	<b>Tech Brief/Originator Number Index</b> . . . . .	<b>I-77</b>

## 01 ELECTRICAL (ELECTRONIC)

JPL-236A

A system of modular chassis structures has simplified the design for mounting a number of printed circuit boards. This design is structurally adaptable to computer and industrial control system applications.

B63-10193  
REMOVABLE PREHEATER ELEMENTS IMPROVE OXIDE  
INDUCTION FURNACE

LEIPOLD, M. H. JAN. 1964

JPL-288

Heat and corrosion resistant preheater elements are used in oxide induction furnaces to raise the temperature to the level for conducting electricity. These preheater elements are then removed and the induction coil energized.

B63-10227  
ELECTROMECHANICALLY OPERATED CAMERA SHUTTER  
PROVIDES UNIFORM EXPOSURE

FORD, A. G. MAR. 1964

JPL-357

A unidirectional camera shutter employing a solenoid and mechanical linkages permits uniform exposure and minimizes distortion of the image formed in the camera.

B63-10229  
FLANGE ON MICROWAVE ANTENNA SUBREFLECTOR CUTS  
GROUND NOISE

POTTER, P. D. MAY 1964

JPL-362

The subreflector of a microwave antenna has been redesigned so that its outer edge has a conical flange. This reduces noise by causing ground energy radiation to cancel out before entering the antenna.

B63-10238  
SHAPED SUPERCONDUCTOR CYLINDER RETAINS INTENSE  
MAGNETIC FIELD

HILDEBRANDT, A. F. WAHLQUIST, H. MAY 1964

JPL-381

The curve of the inner walls of a superconducting cylinder is plotted from the flux lines of the magnetic field to be contained. This shaping reduces maximum flux densities and permits a stronger and more uniform magnetic field.

B63-10250  
LEVEL OF SUPER-COLD LIQUIDS AUTOMATICALLY  
MAINTAINED BY LEVELOMETER

TENER, W. M. MAR. 1964

JPL-397

A levelometer system, in which the level of cryogenic liquid to be controlled affects the level of an electrolyte, automatically switches a pump on and off. A pressure-sensitive diaphragm can also throw a microswitch to start or stop the pump.

B63-10255  
TRANSFLUXOR CIRCUIT AMPLIFIES SENSING CURRENT  
FOR COMPUTER MEMORIES

MILLIGAN, G. C. MAR. 1964

JPL-406

To transfer data from the magnetic memory core to an independent core, a reliable sensing amplifier has been developed. Later the data in the independent core is transferred to the arithmetical section of the computer.

B63-10258  
DOUBLE-THROW MICROWAVE DEVICE SWITCHES TWO  
LINES QUICKLY

CLAUSS, R. STELZRIED, C. T. FEB. 1964

JPL-410

By combining a single-throw microwave switch with a microwave circulator in a circuit, two input lines can be switched quickly. There is only a brief transition time when both /or neither/ of the two lines are connected to an output line.

B63-10262  
IGNITING SYSTEM FOR MERCURY VAPOR LAMPS PRO-  
TECTS TRANSISTORIZED SUSTAINING SUPPLY

GUISINGER, J. E. JUL. 1964

JPL-421

B63-10006  
SETTING OF ANGLES ON MACHINE TOOLS SPEEDED BY  
MAGNETIC PROTRACTOR

VALE, L. B. MAY 1964

ARC-5

An adjustable protractor facilitates transference of angles to remote machine tools. It has a magnetic base incorporating a beam which can be adjusted until its shadow coincides with an image on the screen of a projector.

B63-10024  
SOLENOID PERMITS REMOTE CONTROL OF STOP WATCH  
AND ASSURES RESTARTING

KODAI, C. JUN. 1964

FRC-17

A stop watch which may be remotely controlled by the use of a solenoid mechanism is described. When the solenoid is energized the coil spring pulls the lever arm and starts the balance wheel. When it is not energized, the spring pulls the lever and stops the watch.

B63-10027  
INCREASED PERFORMANCE RELIABILITY OBTAINED  
WITH DUAL /REDUNDANT/ OSCILLATOR SYSTEM

NOLIS, W. M. /IBM/ MAR. 1964

GSFC-36

Two crystal-controlled oscillators, each with an associated buffer stage, provide an output at a common point. The circuit design gives high reliability control of output frequency and amplitude.

B63-10033  
INDIUM FOIL WITH BERYLLIA WASHER IMPROVES  
TRANSISTOR HEAT DISSIPATION

HILLIARD, J. JOHN, J. E. A. APR. 1964 /SEE

NASA-TN-D-1753/

GSFC-42

Indium foil, used as an interface material in transistor mountings, greatly reduces the thermal resistance of beryllia washers. This method improves the heat dissipation of power transistors in a vacuum environment.

B63-10091  
MODIFIED FILTER PREVENTS CONDUCTION OF MICRO-  
WAVE SIGNALS ALONG HIGH-VOLTAGE POWER SUPPLY  
LEADS

MATHISON, R. P. MAY 1964

JPL-63

Very lossy powdered iron material, in the lining of a polyester resin, replaces the dielectric material in the short coaxial transmission line of a simple filter. The lossy material absorbs microwave signals along high voltage power supply leads.

B63-10118  
STEPPING SWITCH WITH SIMPLE ACTUATOR PROVIDES  
MANY CONTACTS IN SMALL SPACE

MILLER, J. V. MAY 1964

JPL-122

To reduce the space required for a stepping switch with many contacts, a simple electromechanical actuator with a maximum number of wipers has been incorporated into a compact assembly. This small sized unit is inexpensive to fabricate.

B63-10174  
MODULAR CHASSIS SIMPLIFIES PACKAGING AND  
INTERCONNECTING OF CIRCUIT BOARDS

ARENS, W. E. BOLINE, K. G. MAY 1964

01 ELECTRICAL (ELECTRONIC)

- A current from a sustaining power supply flows through the mercury vapor lamp and, as there are no resistors in series with this supply, the power is efficiently used. This high voltage igniting device protects the transistorized high current, low voltage power supply.
- B63-10264**  
NOVEL HORN ANTENNA REDUCES SIDE LOBES, IMPROVES RADIATION PATTERN  
POTTER, P. D. APR. 1964  
JPL-425  
A horn antenna, combining two propagation modes at selected power ratios, reduces side lobes, and improves the radiation characteristics. Noise and unwanted signals are considerably suppressed.
- B63-10280**  
METER ACCURATELY MEASURES FLOW OF LOW-CONDUCTIVITY FLUIDS  
LOVE, E. G. MAY 1964  
JPL-0021  
An electromagnetic flowmeter has been adjusted to minimize the errors inherent in measuring the flow of low conductivity fluids. This is done through use of a direct-coupled, differential cathode-follower, whose grid potential is adjustable with respect to ground levels.
- B63-10284**  
SMALL DIGITAL RECORDING HEAD HAS PARALLEL BIT CHANNELS, MINIMIZES CROSS TALK  
ELLER, E. E. LAUE, E. G. MAY 1964  
JPL-0029  
A small digital recording head consists of closely spaced parallel wires, imbedded in a ferrite block to concentrate the magnetic flux. Parallel-recorded information bits are converted into serial bits on moving magnetic tape and cross talk is suppressed.
- B63-10321**  
IMPROVED VARIABLE-RELUCTANCE TRANSDUCER MEASURES TRANSIENT PRESSURES  
MORTON, R. W. PATTERSON, J. L. MAY 1964  
LANGLEY-10  
A flush-diaphragm pickup and a feedback-stabilized carrier amplifier are among the features incorporated into an improved variable-reluctance transducer. This low-impedance device responds to steady-state as well as transient pressures.
- B63-10338**  
OPTICS USED TO MEASURE TORQUE AT HIGH ROTATIONAL SPEEDS  
KRSEK, A., JR. TIEFERMAN, M. DEC. 1964  
LEWIS-13  
In measuring torque transmitted by a high speed rotation shaft, an apparatus has been devised which includes a shaft, an optical system and readout servomechanism. This highly accurate method uses only optical contact with moving part and is statically calibrated.
- B63-10342**  
RADIANT HEATER FOR VACUUM FURNACES OFFERS HIGH STRUCTURAL RIGIDITY, LOW HEAT LOSS  
VARY, A. MAY 1964  
LEWIS-39  
Some problems associated with high temperature heaters for vacuum furnaces have been eliminated by the use of shaped filaments of refractory metal. These filaments, supported in cylindrical array by ceramic spacers, operate with high voltage, low current power.
- B63-10440**  
NEW APPARATUS INCREASES ION BEAM POWER DENSITY  
BALDWIN, L. V. SANDBORN, V. A. JUN. 1964  
LEWIS-73  
To increase ion engine or rocket power, an ion source and emitter, an ion beam focusing electrode, and an ion accelerator are incorporated into the system. In operation the space charge surrounding the ion emitter decreases, the ion beam density accelerates, and engine power increases.
- B63-10443**  
IMPROVED SENSOR COUNTS MICROMETEOROID PENETRATIONS  
DAVISON, E. H. MAY 1964  
LEWIS-76  
A sensor, consisting of a thin dual-capacitor assembly with an outer film of thermal-control material, is used to detect micrometeoroid particles. A coincidence counting circuit is used to count the penetrations.
- B63-10493**  
TWO-STAGE EMITTER FOLLOWER IS TEMPERATURE STABILIZED  
SCHMIDT, M. H. /MCDONNELL AIRCRAFT CORP./ MAY 1964  
MSC-20  
Two-stage temperature stabilized circuit using two transistors is described. Increase in temperature causes the base-to-emitter voltage of n-p-n transistor to become less positive whereas the base-to-emitter voltage of p-n-p transistor becomes less negative, so the temperature-induced variation in  $V_{sub 1}$  and  $V_{sub 2}$  cancel out.
- B63-10508**  
CIRCUIT SWITCHES LATCHING RELAY IN RESPONSE TO SIGNALS OF DIFFERENT POLARITY  
SMITH, L. S. /ELECTRO-OPTICAL SYSTEMS, INC./ MAY 1964  
WOO-055  
A circuit using one power supply and two storage capacitors, which may be separately discharged in opposite directions through a relay in response to change in polarity of a signal, is described.
- B63-10511**  
FREQUENCY-SHIFT-KEYER CIRCUIT IMPROVES PCM CONVERSION FOR RADIO TRANSMISSION  
MIKSZAN, D. P. /WESTINGHOUSE ELEC. CORP./ JUN. 1964  
GSFC-80  
A data logic circuit employing a fixed frequency, square-wave oscillator and flip-flop gates allows for the shifting from one frequency to the other at the end of a whole number of cycles of one shift frequency and at the beginning of a cycle of the second shift frequency.
- B63-10512**  
LOW-COST TAPE SYSTEM MEASURES VELOCITY OF ACCELERATION  
HARTENSTEIN, R. JUN. 1964  
GSFC-85  
By affixing perforated magnetic recording tape to the falling end of a body, acceleration and velocity were measured. The measurement was made by allowing the tape to pass between a light source and a photoelectric sensor. Data was obtained from a readout device.
- B63-10514**  
COMPUTER CIRCUIT WILL FIT ON SINGLE SILICON CHIP  
SMITH, C. JUN. 1964  
JPL-513  
A simplified computer logic circuit of two nand/nor gates and three additional inputs to accomplish the count and shift function is described. The circuit has capacity for parallel read-in, counting, serial shiftout, complement input and set and reset.
- B63-10529**  
CONNECTOR FOR THERMOCOUPLE LEADS SAVES COSTLY WIRE, MAKES RELIABLE CONNECTORS  
MILLER, H. B. APR. 1964  
LANGLEY-26  
A connector for use in the thermocouple circuits which is silver-brazed to the metal thermocouple sheath on one end and crimped over the insulation of the flexible lead on the other, assures protection against breakage and abrasion. A moisture-proof insulating material is used to encapsulate the wire junctions.
- B63-10536**  
HOT-AIR SOLDERING TECHNIQUE PREVENTS OVERHEATING OF ELECTRICAL COMPONENTS

INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ FEB.  
1964  
GSFC-91

By using a hot-air gun with a small orifice, heat may be localized to the soldering area of the chassis. The solder is placed around the capacitor which is inserted in the mounting hole so the ring is in contact with the chassis.

B63-10537  
SIMPLE CIRCUIT PROVIDES ADJUSTABLE VOLTAGE  
WITH LINEAR TEMPERATURE VARIATION  
MOEDE, L. W. /DATAMETRICS CORP./ MAR. 1964  
JPL-WOO-029

A bridge circuit giving an adjustable output voltage that varies linearly with temperature is formed with temperature compensating diodes in one leg. A resistor voltage divider adjusts to temperature range across the bridge. The circuit is satisfactory over the temperature range of -20 degrees centigrade to +80 degrees centigrade.

B63-10551  
UNMANNED SEISMOMETER LEVELS SELF, CORRECTS  
DRIFT ERRORS  
SUTTON, G. /COLUMBIA U./ MAY 1964  
GSFC-100

An unmanned, self-leveling seismometer is developed which contains three subsystems- a mechanical, an electronic pickoff and feedback, + a leveling and vertical centering subsystem. Earth motions are detected by means of a seismic mass coupled to a coil-magnet assembly and a differential capacitor plate assembly.

B63-10553  
TRANSISTORIZED TRIGGER CIRCUIT IS FREQUENCY-  
CONTROLLABLE  
MOORE, E. T. /DUKE U./ JUN. 1964  
GSFC-111

A trigger circuit employing two unijunction transistor oscillators, whose frequency is varied by changing the base-to-base voltage, provides variable electrical control of the frequency.

B63-10554  
HIGHLY EFFICIENT SQUARE-WAVE OSCILLATOR OPER-  
ATOR AT HIGH POWER LEVELS  
HALL, J. E., JR. /DUKE U./ JUN. 1964  
GSFC-112

A square-wave oscillator circuit containing only simple resistor-capacitor combinations and transistors operates with high efficiency at relatively high power levels.

B63-10555  
COMPUTER DETERMINES HIGH-FREQUENCY PHASE  
STABILITY  
NICHOLS, G. B. JUL. 1964  
GSFC-113

Determination of phase stability of a high frequency signal using a computer is accomplished by a circuit using two auxiliary oscillators, multipliers and low-pass filters in cross correlation with the oscillator producing the signal of interest.

B63-10561  
TINY SENSOR-TRANSMITTER CAN WITHSTAND EXTREME  
ACCELERATION, GIVES DIGITAL OUTPUT  
MOSSINO, R. L. ROBINSON, G. NOV. 1964  
ARC-22

A self-pulsing oscillator transmits a pulsed signal. The time between pulses and the frequency are controlled by two networks. Variations in the component values in each of the two networks, due to environmental changes, appear as changes in frequency and time between pulses in the transmitted signal. Such a sensor is used to measure physical magnitudes.

B63-10567  
SIMPLE CIRCUIT CONTINUOUSLY MONITORS  
THERMOCOUPLE SENSOR  
GREENWOOD, T. L. AUG. 1964  
M-FS-61

A series circuit was developed to check the continuity in thermocouple sensors. This method may be used in monitoring continuity in any dc

voltage-operated control circuit.

B63-10572  
DEVICE CALIBRATES VIBRATION TRANSDUCERS AT  
AMPLITUDES UP TO 20 G.  
GREENWOOD, T. L. AUG. 1964  
M-FS-86

A piezoelectric transducer provides accurate calibration of vibration amplitudes to 20 g. The calibration system uses an electromagnetically driven resonant beam to generate mechanical vibrations at a fixed frequency.

B63-10579  
SMALL FOAMED POLYSTYRENE SHIELD PROTECTS LOW-  
FREQUENCY MICROPHONES FROM WIND NOISE  
TEDRICK, R. N. MAY 1964  
M-FS-123

A foamed polystyrene noise shield for microphones has been designed in teardrop shape to minimize air turbulence. The shield slips on and off the microphone head easily and is very effective in low-frequency sound intensity measurements.

B63-10596  
FRONT AND BACK PRINTED CIRCUIT LAYOUTS  
PRESENTED ON SINGLE SHEET  
PERRY, J. OCT. 1964  
GSFC-93

A diazo photographic process of clear plastic masters is used in reproducing front and back printed circuit layouts of differing intensity on a single sheet.

B63-10597  
PRECISION GAGE MEASURES ULTRAHIGH VACUUM  
LEVELS  
HUDSON, J. B. SEARS, G. W. /GEN. DYN. CORP./  
JUN. 1964  
GSFC-114

An ionization gauge in which internally generated X-rays are minimized is described. This gauge permits the measurement of gas pressures in ultrahigh systems of micro-pico torr.

B63-10599  
LIQUID SWITCH IS REMOTELY OPERATED BY LOW DC  
VOLTAGE  
MOORE, E. T. /DUKE U./ MAY 1964  
GSFC-119

A liquid switch which does not depend on any mechanical, gravitational, or inertial actuation is developed for use in space environments. It may be remotely operated on low DC voltage.

B63-10600  
CIRCUIT CONTROLS TRANSIENTS IN SCR INVERTERS  
MOORE, E. T. WILSON, T. G. /DUKE U./ JUN. 1964  
GSFC-120

The elimination of starting difficulties in SCR inverters is accomplished by the addition of two taps of the output winding of the inverter. On starting or under transient loads the two additional taps deliver power through diodes without requiring quenching of SCR currents in excess of normal starting load.

B63-10603  
MONOSTABLE CIRCUIT WITH TUNNEL DIODE HAS FAST  
RECOVERY  
HEFFNER, P. MAY 1964  
GSFC-132

A monostable multivibrator circuit using a tunnel diode makes it possible for the MSMV to exceed the performance of present multivibrators in two respects. The rise time of the output voltage is faster and the duty cycle is raised to approximately 95 percent.

B63-10606  
NEW SINTERING PROCESS ADJUSTS MAGNETIC VALUE  
OF FERRITE CORES  
INNOVATOR NOT GIVEN /IBM/ MAY 1964  
GSFC-129

A two-phase sintering technique based on time and temperature permits reversible control of the coercive threshold of sintered ferrite cores. Threshold coercivity may be controlled over a substantial range of values by selective control

01 ELECTRICAL (ELECTRONIC)

of the cooling rate.

**B63-10609**  
TEMPERATURE-SENSITIVE NETWORK DRIVES ASTABLE  
MULTIVIBRATOR  
INNOVATOR NOT GIVEN /RCA/ OCT. 1964  
GSFC-137

The development of a simple circuit using two zener diodes and five resistors, which provides a temperature-sensitive voltage to drive the astable multivibrator, is described.

**B63-10613**  
CRYOGENIC WAVEGUIDE WINDOW IS SEALED WITH  
PLASTIC FOAM  
CLAUSS, R. STELZRIED, C. T. JUN. 1964  
JPL-559

Waveguide windows made with polystyrene preformed plastic and sealed with foamed-in-place plastic are useful in any microwave waveguide system using cryogenic cooling.

**B64-10002**  
CIRCUIT RELIABILITY BOOSTED BY SOLDERING PINS  
OF DISCONNECT PLUGS TO SOCKETS  
PIERCE, W. B. MAR. 1964  
JPL-447

Where disconnect pins must be used for wiring and testing a circuit, improved system reliability is obtained by making a permanent joint between pins and sockets of the disconnect plug. After the circuit has been tested, contact points may be fused through soldering, brazing, or welding.

**B64-10004**  
ULTRA-SENSITIVE TRANSDUCER ADVANCES MICRO-  
MEASUREMENT RANGE  
ROGALLO, V. L. MAY 1964  
ARC-26

An ultrasensitive piezoelectric transducer, that converts minute mechanical forces into electrical impulses, measures the impact of micrometeoroids against space vehicles. It has uniform sensitivity over the entire target area and a high degree of stability.

**B64-10007**  
LOW-POWER TRANSISTORIZED CIRCUIT PROVIDES  
STAIRCASE WAVEFORM  
BREEN, G. D. JUL. 1964  
GSFC-48

A low input power transistorized circuit is used to generate a staircase waveform of high step uniformity. Other characteristics are low step droop, fast transition time, and no feedback.

**B64-10010**  
MODIFIED RF COAXIAL CONNECTOR ENDS VACUUM  
CHAMBER WIRING PROBLEM  
WEINER, D. MAY 1964  
GSFC-150

A standard radio frequency coaxial connector is modified so that a plastic insulating sleeve can be mounted in the wall of a vacuum chamber. This eliminates ground loops and interference from cable connections.

**B64-10016**  
COMPACT COAXIAL CONNECTOR FOR PRINTED CIRCUIT  
ADDS RELIABILITY  
RADECKE, T. F. MAY 1964  
MSC-57

Soldering and welding techniques are used to connect a coaxial cable to a printed circuit board. This device aids reliability control of equipment as standard connectors are bulky and heavy.

**B64-10017**  
BLOCKING OSCILLATOR USES LOW TRIGGERING  
VOLTAGE  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
DEC. 1964  
MSC-58

To prevent premature triggering of a blocking oscillator, a smaller magnetic core is added to the conventional oscillator circuit. This serves as a second blocking oscillator and has a lower triggering threshold.

**B64-10019**  
NEW METHOD USED TO FABRICATE GALLIUM ARSENIDE  
PHOTOVOLTAIC DEVICE  
ELLIS, S. G. /RCA/ JUN. 1964  
WOO-062

A new method for fabricating photocells, or solar cells, substitutes copper iodide for zinc diffusion. This produces a p-type surface layer and a photovoltaic junction.

**B64-10024**  
EFFICIENT CIRCUIT TRIGGERS HIGH-CURRENT, HIGH-  
VOLTAGE PULSES  
GREEN, E. D. /WESTINGHOUSE ELEC. CORP./ JUN.  
1964  
MSC-14

A modified circuit uses diodes to effectively disconnect the charging resistors from the circuit during the discharge cycle. Result is an efficient parallel charging, high voltage pulse modulator with low voltage rating of components.

**B64-10042**  
OHMMETER SENSES DEPLETION OF LUBRICANT IN  
JOURNAL BEARINGS  
ROSS, A. O. DEC. 1964  
LEWIS-37

An ohmmeter is used as a sensor to determine when the lubricating oil in a high speed journal bearing becomes depleted.

**B64-10064**  
DIGITAL LOGIC ELEMENTS PROVIDE ADDITIONAL  
FUNCTIONS FROM ANALOG INPUT  
MATTY, T. C. /MCDONNELL AIRCRAFT CORP./ JUN.  
1964  
MSC-64

A D.C. analog input can be used to produce an integrator with high dynamic range or a position servo with inherent stability. This is done by a switching system using digital-to-analog converters and an electronic switch to obtain the desired outputs.

**B64-10065**  
CONTINUITY TESTER SCREENS OUT FAULTY SOCKET  
CONNECTIONS  
GOLDING, G. MAY 1964  
JPL-596

A device, used before and after assembly, tests the continuity of an electrical circuit through each pin and socket of multiple connector sockets. Electrically insulated except at the contact area, a test probe is dimensioned to make contact only in properly formed sockets.

**B64-10080**  
IMPROVED INSERTION-LOSS TESTER  
FINNIE, C. J. SCHUSTER, D. JUN. 1964  
JPL-358

An improved test method accurately measures the insertion loss of rf components while avoiding amplifier drift. Currents are balanced across a bridge transformer with shorted probes and then with each component to be tested. Differences in adjustments indicate the loss.

**B64-10109**  
ANALOG DEVICE SIMULATES PHYSIOLOGICAL  
WAVEFORMS  
HICKMAN, D. M. NOV. 1964  
MSC-51

An analog physiological simulator generates representative waveforms for a wide range of physiological conditions. Direct comparison of these waveforms with those from telemetric inputs permits quick detection of signal parameter degradation.

**B64-10114**  
AUXILIARY SILVER ELECTRODE ELIMINATES TWO-STEP  
VOLTAGE DISCHARGE CHARACTERISTIC OF SILVER-  
ZINC CELLS  
CHREITZBERG, A. M. /ELEC. STORAGE BATTERY CO./  
JUN. 1964  
GSFC-169

In silver-zinc cells, an auxiliary silver electrode is electrically connected to the positive terminal only during discharge. This

eliminates the two-step discharge characteristic of such cells.

**B64-10118**  
USE OF PHOTOGRAPHS SPEEDS INSPECTION OF  
PRINTED-CIRCUIT BOARDS  
STARK, E. /IBM/ JUL. 1964  
MSC-72

The projected images of a printed circuit board and the engineering drawing are superimposed on a screen for visual comparison. This technique speeds inspection, reduces the incidence of error.

**B64-10122**  
SIMPLE TRANSDUCER MEASURES LOW HEAT-TRANSFER  
RATES  
LAUMANN, E. A. OCT. 1964  
JPL-466

A simple transducer is used to measure low rates of convective and conductive heat transfer from a fluid to a cooled surface under steady-state conditions. Temperature drop is measured by two thermocouples imbedded in a rod of low thermal conductivity.

**B64-10143**  
FIELD-EFFECT TRANSISTOR IMPROVES ELECTROMETER  
AMPLIFIER  
MUNOZ, R. NOV. 1964  
ARC-36

An electrometer amplifier uses a field effect transistor to measure currents of low amperage. The circuit, developed as an AC amplifier, is used with an external filter which limits bandwidth to achieve optimum noise performance.

**B64-10144**  
RING COUNTER MAY BE ADVANCED OR RETARDED BY  
COMMAND SIGNAL  
LIBBY, J. N. MOORE, H. D. JUL. 1964  
GSFC-101

A power logic circuit, with bidirectional capability, is used to drive small loads in planned sequence. This is designed in the form of a shift register, with a reversible ring counter.

**B64-10150**  
NOVEL CIRCUIT COMBINES PULSE STRETCHER WITH  
NOR GATE  
CLIFF, R. A. OCT. 1964  
GSFC-187

A pulse-stretching circuit added to a conventional NOR gate circuit detects a preselected state and produces a pulse that the pulse stretcher maintains for a long enough period to reset all counter stages.

**B64-10158**  
EMISSION TESTER FOR HIGH-POWER VACUUM TUBES  
LUNDY, C. OCT. 1964  
JPL-628

A simple emission-testing circuit for high power vacuum tubes to check their output stability is described. With modification it may be useful in testing mercury-arc rectifiers.

**B64-10163**  
FIELD EFFECT TRANSISTORS USED AS VOLTAGE-  
CONTROLLED RESISTORS  
INNOVATOR NOT GIVEN /IBM/ NOV. 1964  
M-FS-174

Two new methods of incorporating field effect transistors into circuit designs have resulted in linear response of this type transistor over a wide range of controlled voltage levels. This increases its usefulness as a voltage-controlled resistor.

**B64-10171**  
SUBMINIATURE BIOTELEMETRY UNIT PERMITS REMOTE  
PHYSIOLOGICAL INVESTIGATIONS  
DEBOO, G. J. FRYER, T. B. OCT. 1964  
ARC-39

A subminiature biotelemetry transmitter permits the measurement of biopotential response in humans or animals to controlled environmental stimuli without discomfort while engaged in normal activities.

**B64-10173**  
HIGH-PASS RF COAXIAL FILTER REJECTS DC AND LOW  
FREQUENCY SIGNALS  
BAILEY, J. W. MC AFEE, D. F. OCT. 1964  
GSFC-73

A low-loss RF filter element for coaxial transmission provides DC isolation and eliminates low frequency signals. The characteristic impedance of the transmission line is not affected, as the design permits direct connection of the filter to the line.

**B64-10200**  
BINARY SYSTEM GENERATES SIDEREAL RATE FROM  
STANDARD SOLAR RATE  
GRANATA, R. MC CAUL, P. OCT. 1964  
GSFC-190

A sidereal rate output from mean solar rate input is derived from a sidereal generator that uses digital division and multiplication techniques.

**B64-10209**  
RASTER LINEARITY OF VIDEO CAMERAS CALIBRATED  
WITH PRECISION TESTER  
INNOVATOR NOT GIVEN /RCA/ DEC. 1964  
GSFC-200

The time between transitions in a camera's video output is measured when registered at reticle marks on the vidicon faceplate. This device permits precision calibration of raster linearity of television camera tubes.

**B64-10222**  
COMPACT CARTRIDGE DRIVES CODED TAPE AT  
CONSTANT READOUT SPEED  
AUSTIN, D. C. OCT. 1964  
JPL-472

To facilitate storage and repetitive reading of short-program coded tape, a cartridge case, containing mechanical drive and readout assemblies, has been fabricated. The drive transports the tape past a conventional pickup device during the reading function.

**B64-10226**  
TEMPERATURE-COMPENSATION CIRCUIT STABILIZES  
PERFORMANCE OF VIDICONS  
MALLING, L. R. NOV. 1964  
JPL-486

A simple transistor circuit uses a thermistor to change the vidicon target potential in relation to temperature differences.

**B64-10237**  
APPARATUS MEASURES CONCENTRATION OF SUSPENDED  
DROPLETS IN GAS STREAMS  
BOOTH, F. W. DEC. 1964  
LANGLEY-31

An apparatus, operating on the principle of wet-and-dry-bulb thermometry, permits intermittent or continuous measurement of the concentration of droplets dispersed in a gas stream over a wide range of gas pressure.

**B64-10255**  
ELECTRONIC DEVICE SIMULATES RESPIRATION RATE  
AND DEPTH  
THOMAS, J. A. NOV. 1964  
MSC-89

An oscillator circuit and a thermistor, in close proximity to a light bulb, periodically alter the heat output of the bulb by varying the voltage across its filament. Use of this simulator permits checkout tests on pneumographs.

**B64-10258**  
DIGITAL CARDIOMETER COMPUTES AND DISPLAYS  
HEARTBEAT RATE  
MITCHELL, V. M. NOV. 1964  
MSC-93

To compute the heartbeat rate from the waveform output of an electrocardiogram, a digital cardiometer with solid state circuit elements has been developed. This computes the beat every 15 seconds and visually presents the data on numerical display tubes.

**B64-10259**  
PNEUMOTACHOMETER COUNTS RESPIRATION RATE OF

01 ELECTRICAL (ELECTRONIC)

HUMAN SUBJECT

GRAHAM, U. NOV. 1964  
MSC-92

To monitor breaths per minute, two rate-to-analog converters are alternately used to read and count the respiratory rate from an impedance pneumograph over fixed intervals. The converter outputs are sequentially displayed numerically on electroluminescent matrices.

B64-10271

IMPROVED TECHNIQUE FOR LOCALIZING ELECTRO-POLISHING FEATURES NOVEL NOZZLES  
INNOVATOR NOT GIVEN /GEN. DYN./ASTRONAUTICS/ NOV. 1964

W00-101

Impingement electropolishing is accomplished by use of an electrolyte film, which is evenly distributed by an insulated nozzle designed to match the contour of the workpiece to be treated. The workpiece is connected to the positive terminal of a generator and the nozzle to the negative terminal.

B64-10280

SERVO SYSTEM FACILITATES PHOTOELASTIC STRAIN MEASUREMENTS ON RESINS  
OTTS, J. W. NOV. 1964  
JPL-504

To facilitate photoelastic measurements of the strains developed by stresses applied to birefringent resins, a servomechanism is employed.

B64-10281

PTC THERMISTOR PROTECTS MULTILOADED POWER SUPPLIES  
LEVERONE, H. MANDELL, N. NOV. 1964  
GSFC-236

A PTC /positive-temperature-coefficient/ thermistor placed in series with each branch load of a multiload circuit prevents power loss in parallel branches. This thermistor may be used in any circuit requiring current limiting or intended overload resetting.

B64-10283

MOUNTING FOR DIODES PROVIDES EFFICIENT HEAT SINK  
INNOVATOR NOT GIVEN /RCA/ NOV. 1964  
M-FS-197

Efficient heat sink is provided by soldering diodes to metal support bars which are brazed to a ceramic base. Electrical connections between diodes on adjacent bars are made flexible by metal strips which aid in heat dissipation.

B64-10299

RADIATION DETECTOR-OPTICAL HANGING DEVICE IS OF SIMPLIFIED CONSTRUCTION  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ DEC. 1964  
GSFC-251

A simplified radiation detector was designed which employs an activated continuous front surface consisting of either the diffused or barrier type of semiconducting material with a grid structure on the nonactivated side of the detector. Its form may be either a rectangular coordinate or a polar coordinate system.

B64-10305

TRANSISTORIZED CONVERTER PROVIDES NONDISSIPATIVE REGULATION  
INNOVATOR NOT GIVEN /DUKE U./ DEC. 1964  
GSFC-238

A transistorized regulator converter efficiently converts fluctuating input voltages to a constant output voltage, avoiding the use of saturable reactors. It is nondissipative in operation and functions in an open loop through variable duty cycles.

B64-10309

WELDING PROCEDURE IMPROVES QUALITY OF WELDS, OFFERS OTHER ADVANTAGES  
MC CAMPBELL, W. M. MC CAIG, J. C. DEC. 1964  
M-FS-32

An improved procedure for arc spot welding uses the SIGMA /submerged inert gas metallic arc/

method. This has resulted in welds of higher quality than are obtainable by conventional means.

B64-10320

VOLTAGE GENERATOR SWEEPS OSCILLATOR FREQUENCY LINEARLY WITH TIME  
INNOVATOR NOT GIVEN /MELPAR, INC./ JAN. 1965  
M-FS-219

A voltage-tuned oscillator circuit is described which sweeps the output signal frequency linearly exponentially varying with time.

B64-10330

ECONOMICAL FABRICATION PROCESS PRODUCES HIGH-QUALITY JUNCTION TRANSISTORS  
INNOVATOR NOT GIVEN /IBM/ DEC. 1964  
JPL-SC-065

A convenient, three-step fabrication process, with a p-type layer of gallium arsenide vapor-deposited on a starting wafer of germanium, is used to produce heterojunction-homojunction p-n-p transistors. These are of high quality with good injection efficiency and low capacitance.

B64-10349

BANDWIDTH SWITCHING IS TRANSIENT-FREE, AVOIDS LOSS OF LOOP LOCK  
INNOVATOR NOT GIVEN /SPACE TECHNOL. LABS./ DEC. 1964  
W00-054

A circuit, in a wide bandwidth mode, overcomes transient-producing capacitance switching by maintaining an equivalent voltage at all times. Bandwidth switching may be done at any time, and integrity of the loop lock is maintained.

B65-10001

CIRCUIT CONVERTS AM SIGNALS TO FM FOR MAGNETIC RECORDING  
INNOVATOR NOT GIVEN /RCA/ JAN. 1965  
GSFC-227

Convert AM signals to FM for magnetic recording by relaxation-type voltage-controlled oscillator /VCO/. This circuit may be used in radar, telemetry, and test equipment.

B65-10002

TUNNEL-DIODE CIRCUIT FEATURES ZERO-LEVEL CLIPPING  
BUSH, E. G. JAN. 1965  
GSFC-241

Tunnel-diode circuit starts clipping action as input voltage crosses zero axis. This clipper circuit is effective as limiter in FM receiver.

B65-10005

COMPUTER MODIFICATION REDUCES TIME OF PERFORMING ITERATIVE DIVISION  
INNOVATOR NOT GIVEN /IBM/ FEB. 1965  
M-FS-166

Time reduction in performing iterative division results from using a serial-by-parallel divider employing a look-ahead feature that predetermines the sign relationships of several iterations before the computer cycle begins. This method can be employed in any data handling system performing high-speed division.

B65-10006

MODIFICATION INCREASES LIGHT OUTPUT OF INJECTION-LUMINESCENT DIODES  
INNOVATOR NOT GIVEN /RCA/ JAN. 1965 SEE ALSO B64-10283  
M-FS-192

Removing a section of the electrode area from the N-face of injection-luminescent diodes for pumping lasers substantially increases light output. Light is emitted from the N-face as well as from the four edges of the diode.

B65-10010

INEXPENSIVE, STABLE CIRCUIT MEASURES HEART RATE  
VICK, H. A. JAN. 1965  
MSC-95

Inexpensive transistorized circuit provides reliable analog indications of heart rate in response to preamplified electrocardiograph signal applied to its input.

**B65-10011**  
**CIRCUIT IMPROVEMENT PRODUCES MONOSTABLE MULTIVIBRATOR WITH LOAD-CARRYING CAPABILITY**  
 GOLDMAN, N. E. SCHAFFERT, J. C. JAN. 1965  
 GSFC-34A  
 Improved circuit provides greater reliability and load-carrying capabilities for monostable multivibrator.

**B65-10012**  
**HELICAL COAXIAL-RESONATOR MAKES EXCELLENT RF FILTER**  
 INNOVATOR NOT GIVEN /RCA/ JAN. 1965 1965  
 GSFC-243  
 Isolation of closely spaced transmitting and receiving frequencies of an antenna without insertion loss by filtering the receiver input is accomplished by an inner conductor with two winding helices and an outer conductor of aluminum. A tuning slug is at either end of the inner conductor form.

**B65-10013**  
**ZENER DIODE FUNCTION GENERATOR REQUIRES NO EXTERNAL REFERENCE VOLTAGE**  
 BOLTE, G. BURNS, R. JAN. 1965  
 JPL-33  
 Function generator utilizing parallel impedance networks with zener diodes produces functions which are discontinuous in slope. The function generated appears at the output of the parallel network in the form of a voltage varying in time.

**B65-10018**  
**CARBON ARC IGNITION IMPROVED BY SIMPLE AUXILIARY CIRCUIT**  
 INNOVATOR NOT GIVEN /RCA/ JAN. 1965  
 MSC-103  
 High voltage, low current pulse in series with arc power supply efficiently ignites a carbon arc. The easily and economically produced circuit is useful with arc burners and searchlights and with plasma jets.

**B65-10023**  
**MINIATURE STRESS TRANSDUCER HAS DIRECTIONAL CAPABILITY**  
 SAN MIGUEL, A. SILVER, R. H. JAN. 1965  
 JPL-591  
 Miniature stress transducer uses a semi-conductive piezoresistive element to detect stress only on specific axes. Measurement of internal mass stress is based on the compressive deformation of the transducer. The device is applicable to constant stress monitoring in building and dam structural parts.

**B65-10025**  
**LOGIC REDUNDANCY IMPROVES DIGITAL SYSTEM RELIABILITY**  
 INNOVATOR NOT GIVEN /STANFORD RES. INST./ FEB. 1965  
 JPL-SC-069  
 Redundant-channel system automatically corrects any single error in a set of three binary signal channels. This system is especially applicable to digital computers where data is transmitted in parallel channels.

**B65-10026**  
**STEPPING MOTOR DRIVE CIRCUIT DESIGNED FOR LOW POWER DRAIN**  
 INNOVATOR NOT GIVEN /HARVARD COLL./ FEB. 1965  
 GSFC-198  
 High power drain is eliminated by a circuit consisting of a divide-by-two stage, two identical inputs, a wiggle amplifier, driver, and power output stages to drive the step motor.

**B65-10028**  
**TRANSISTOR VOLTAGE COMPARATOR PERFORMS OWN SENSING**  
 CLIFF, R. A. FEB. 1965  
 GSFC-228  
 Detection of the highest voltage input among a group of varying voltage inputs is accomplished by a transistorized voltage comparison circuit. The collector circuits of the transistors perform the sensing function. Input voltage levels are

governed by the transistors.

**B65-10030**  
**LIBRARY OF DOCUMENTS COMPRESSED INTO LAP-HELD DISPLAY KIT**  
 INNOVATOR NOT GIVEN /NATL. CASH REGISTER CO./ FEB. 1965  
 MSC-125  
 A lightweight Apollo flight kit containing microfilmed data is packaged in a hinged box with a viewing screen cover, and a writing surface. It is secured to the users lap.

**B65-10033**  
**PHOTOELECTRIC SEMICONDUCTOR SWITCH OPERATES WITH LOW LEVEL INPUTS**  
 INNOVATOR NOT GIVEN /IBM/ FEB. 1965  
 JPL-SC-068  
 Photoelectric semiconductor switch with a buried emitter region avoids high-leakage currents across the emitter. It exhibits high emitter-to-collector transport efficiency beta at low signal levels.

**B65-10041**  
**PULSE HEIGHT ANALYZER OPERATES AT HIGH REPETITION RATES, LOW POWER**  
 INNOVATOR NOT GIVEN /SPACE TECHNOL. LABS., INC./ FEB. 1965  
 W00-046  
 Simple multistage transistor gating circuit provides a pulse height analyzer that operates at high repetition rates and low power. The circuit compares the input pulse heights to discrete reference voltages.

**B65-10045**  
**THERMISTOR CONNECTOR ASSEMBLY INCREASES ACCURACY OF MEASUREMENTS**  
 INNOVATOR NOT GIVEN /ATLANTIC RES. CORP./ FEB. 1965  
 LANGLEY-62  
 Isolation of the thermistor from spurious heat transfer for accurately measuring ambient air temperatures is accomplished by a mounting consisting of a transparent plastic film bonded to a U-shaped phenolic board with depositions of aluminum on each face and upper edge, and a variable capacitor for fine tuning.

**B65-10047**  
**CIRCUIT DETECTS ERRORS IN ADDRESS CURRENTS FOR MAGNETIC CORE ARRAYS**  
 INNOVATOR NOT GIVEN /IBM/ FEB. 1965  
 M-FS-234  
 Address current error detector generates a signal whenever any error producing conditions arise in magnetic core arrays. Can be used with test equipment and memory storage units.

**B65-10048**  
**MICROPARTICLE IMPACT SENSOR MEASURES ENERGY DIRECTLY**  
 ALEXANDER, W. M. BERG, O. E. FEB. 1965  
 GSFC-252  
 Construction of a capacitor sensor consisting of a dielectric layer between two conductive surface layers and connected across a potential source through a sensing resistor permits measurement of energy of impinging particles without degradation of sensitivity. A measurable response is produced without penetration of the dielectric layer.

**B65-10050**  
**NULLING PYROMETER USES KERR CELL SHUTTER FOR FAST RESPONSE**  
 INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ FEB. 1965  
 NU-0010  
 Conventional pyrometer, in which Kerr cell replaces mechanical shutter and polarizers are added to filters, yields rapid shutter response.

**B65-10051**  
**METAL SHEATH IMPROVES THERMOCOUPLE USING GRAPHITE IN ONE LEG**  
 INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ FEB. 1965  
 NU-0011

01 ELECTRICAL (ELECTRONIC)

Thermocouple using graphite in one leg is sealed in a moistureproof metal sheath which permits high EMF output and good mechanical strength.

**B65-10052**  
ZENER DIODE IS STARTER FOR TRANSISTOR-REGULATED POWER SUPPLY  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
FEB. 1965  
NU-0015

Zener diode in parallel with a silicon transistor supplies the starting current for a transistor-regulated power supply.

**B65-10054**  
PULSE GENERATOR PERMITS NONDESTRUCTIVE TESTING OF COMPONENT BREAKDOWN VOLTAGE  
INNOVATOR NOT GIVEN /HONEYWELL/ MAR. 1965  
MSC-122

Nondestructive testing of the breakdown voltage of transistors and other electronic components is achieved by a simple relay circuit. The circuit operates by applying low-energy, high-voltage microsecond pulses to the components under test.

**B65-10055**  
FM OSCILLATOR USES TETRODE TRANSISTOR  
BOENSEL, D. W. MAR. 1965  
JPL-82

Tetrode-driven crystal oscillator achieves large frequency variations for a given input signal. Frequency control is obtained by variation of the second base current of the tetrode.

**B65-10056**  
VIBRATING-MEMBRANE ELECTROMETER HAS HIGH CONVERSION GAIN  
COON, G. W. DIMEFF, J. APR. 1965  
ARC-38

Vibrating-membrane transducer in a circuit can measure current below 10 to-the-minus 17 ampere. This electrometer has a high conversion gain and a minimum internal power consumption.

**B65-10057**  
FEED-THROUGH HAS POLYTERMINAL FEATURE  
SANDERS, L. H. MAR. 1965  
M-FS-25

Feed-through connector with individual solder pots in the polyterminal side provides good connections with small amounts of solder and permits visual inspection of bonds. Poly-terminal also provides a friction mechanical bond to position conductors prior to soldering.

**B65-10059**  
METAL DIAPHRAGM USED TO CALIBRATE MINIATURE TRANSDUCERS  
INNOVATOR NOT GIVEN /ASTRO-SPACE LABS./ MAR. 1965  
M-FS-207

Dynamic comparative calibration system measures response of miniature pressure transducers. The system is composed of an electromechanically-driven metal diaphragm, a calibrated and an uncalibrated transducer and an oscillator.

**B65-10061**  
SIMPLE CONTROL DEVICE SENSES SOLAR POSITION  
LONBORG, J. O. RANDALL, J. C. MAR. 1965  
JPL-638

The amount of solar radiation incident on a specially prepared bimetallic strip is simply and reliably controlled by a light valve. This device is valuable for systems requiring temperature regulation.

**B65-10062**  
PULSED PLASMA ACCELERATOR OPERATES REPETITIVELY WITHOUT COMPLEX CONTROLS  
SABOL, A. P. MAR. 1965  
LANGLEY-48

Self-repeating pulsed plasma accelerator operates with a wide variety of gases over a large range of pressures without complex control equipment. The accelerator combines a circular channel with a tangential channel at the entrance way of a high-velocity gas.

**B65-10066**  
FUEL CELL SERVES AS OXYGEN LEVEL DETECTOR  
INNOVATOR NOT GIVEN /GE/ MAR. 1965  
JPL-SC-072

Monitoring the oxygen level in the air is accomplished by a fuel cell detector whose voltage output is proportional to the partial pressure of oxygen in the sampled gas. The relationship between output voltage and partial pressure of oxygen can be calibrated.

**B65-10067**  
SENSITIVE LEVEL SENSOR MADE WITH SPIRIT LEVEL, GIVES ELECTRICAL OUTPUT  
BRYANT, E. L. MAR. 1965  
LANGLEY-49

Sensor incorporating a circular spirit level, electrical lamp and two pairs of photocells, provides an electrical indication of flat surface level deviation.

**B65-10068**  
AUTOMATIC THERMAL SWITCH ACCELERATES COOLING-DOWN OF CRYOGENIC SYSTEM  
WIEBE, E. R. MAR. 1965  
JPL-655

Automatic switch uses short stainless steel tube with copper heat sinks to accelerate helium gas cooling and provides good thermal conductivity and good thermal insulation.

**B65-10069**  
FEEDBACK OSCILLATOR FUNCTIONS AS LOW-LEVEL PULSE STRETCHER  
INNOVATOR NOT GIVEN /SPERRY RAND CORP./ MAR. 1965  
GSFC-261

Low trigger pulses of the pulse stretcher circuit are obtained by forward biasing the transistor oscillator. The loop gain is kept below unity and prevents free-running oscillation. Two parallel feedback loops improve the stretching capabilities.

**B65-10072**  
SYNCHRONIZED PULSE GENERATOR NEEDS NO EXTERNAL POWER  
CANRO, C. A. JANNICHE, P. J., JR. MAR. 1965  
GSFC-274

Simple circuit with high input and low output impedance generates a fast rise-time pulse synchronized with an input pulse of slower rise and fall times. Circuit requires no external power.

**B65-10073**  
SYSTEM MEASURES ANGULAR DISPLACEMENT WITHOUT CONTACT  
DAVIS, W. T. MAR. 1965  
LANGLEY-46

Optic system coupled to an electronic detection and measuring system converts angular movement of reflected light to a direct readout, without any direct contact with the object.

**B65-10076**  
LIGHT-SENSITIVE POTENTIOMETER MEASURES PRODUCT OF TWO VARIABLES  
HAERTSCH, O. C. MAR. 1965  
GSFC-240

The output voltage from a photoconductive potentiometer circuit using a galvanometer mirror reflecting the light beam is directly proportional to the product of the input voltage.

**B65-10079**  
PHOTOELECTRIC SENSOR OUTPUT CONTROLLED BY EYEBALL MOVEMENTS  
INNOVATOR NOT GIVEN /SPACO/ MAR. 1965  
M-FS-274

The difference between the infrared absorption of the iris and infrared reflectivity of the eyeball controls the operation of a device consisting of an infrared source and amplifier, a cadmium selenide infrared sensor, and an infrared filter.

**B65-10080**  
PHASE DETECTOR CIRCUIT SYNTHESIZES OWN REFERENCE SIGNAL  
INNOVATOR NOT GIVEN /FAIRCHILD STRATOS CORP./

MAR. 1965  
M-FS-247

Circuit with isolation amplifier connected to a frequency multiplier and synchronous phase detector synthesizes the phase reference signal from the phase modulated input signal.

B65-10085  
TRANSDUCER SENSES DISPLACEMENTS OF PANELS  
SUBJECTED TO VIBRATION  
PEA, R. O. MAR. 1965  
ARC-37

Inductive vibration sensor measures the surface displacement of nonferrous metal panels subjected to vibration or flutter. This transducer does not make any physical contact with the test panel when measuring.

B65-10086  
SYSTEM SELECTS FRAMING RATE FOR SPECTROGRAPH  
CAMERA  
INNOVATOR NOT GIVEN /AM. OPT. CO./ MAR. 1965  
LANGLEY-55

Circuit using zero-order light is reflected to a photomultiplier in the spectrograph monitors incoming radiation to provide an error signal which controls the advancing and driving rate of the film through the camera.

B65-10087  
APPARATUS MEASURES SWELLING OF MEMBRANES IN  
ELECTROCHEMICAL CELLS  
HENNIGAN, T. J. APR. 1965  
GSFC-280

Apparatus consisting of a pressure plate unit, four springs of known spring constant and a micrometer measures the swelling and force exerted by the polymer membranes of alkaline electrochemical cells.

B65-10089  
TRANSDUCER MEASURES TEMPERATURE DIFFERENTIALS  
IN PRESENCE OF STRONG ELECTROMAGNETIC FIELDS  
WALD, D. APR. 1965  
ARC-27

Measurement of temperature rise of cooling water under pressure and in strong electromagnetic fields is accomplished by a transducer using a magnetically shielded thermocouple arrangement. The thermocouple junctions are immersed in oil to isolate them from electric currents in the water.

B65-10091  
SIMULATOR PRODUCES PHYSIOLOGICAL WAVEFORMS  
EKEROOT, S. MAR. 1965  
MSC-94

Physiological waveform simulator capable of producing signals to simulate an axillary and a sternal electrocardiogram, blood pressure, respiratory rate and body temperature. This may be used to check out bioinstrumentation.

B65-10093  
COMPUTER PROGRAMS SIMPLIFY OPTICAL SYSTEM  
ANALYSIS  
INNOVATOR NOT GIVEN /HONEYWELL/ APR. 1965  
GSFC-306

The optical ray-trace computer program performs geometrical ray tracing. The energy-trace program calculates the relative monochromatic flux density on a specific target area. This program uses the ray-trace program as a subroutine to generate a representation of the optical system.

B65-10096  
DIGITAL SYSTEM ACCURATELY CONTROLS VELOCITY  
OF ELECTROMECHANICAL DRIVE  
NICHOLS, G. B. APR. 1965  
GSFC-287

Digital circuit accurately regulates electromechanical drive mechanism velocity. The gain and phase characteristics of digital circuits are relatively unimportant. Control accuracy depends only on the stability of the input signal frequency.

B65-10097  
VARIABLE VOLTAGE SUPPLY USES ZENER DIODE AS  
REFERENCE

KLEINBERG, L. L. LAVIGNE, R. C. APR. 1965  
GSFC-262

Using a zener diode as the reference element, a simple transistorized circuit provides a stable variable reference voltage.

B65-10102  
SIMPLE CIRCUIT FUNCTIONS AS FREQUENCY  
DISCRIMINATOR FOR PFM SIGNALS  
BILLINGSLEY, J. APR. 1965  
GSFC-267

Simple circuit monitors the frequency of PFM /pulse frequency modulated/ telemetry signals. This discriminator can be used as a constant current integrator in such circuits as linear sweep and time delay.

B65-10103  
IMPROVED MAGNETOMETER USES TOROIDAL GATING  
COIL  
INNOVATOR NOT GIVEN /CORNELL UNIV./ APR. 1965  
GSFC-249

Improved magnetometer employs a cylindrical, high permeability magnetic core with a toroidal gating coil and a solenoid pickup coil. Flux interaction can be reduced by electrostatically shielding the pickup coil from the gating coil. The magnetometer principle can be applied to navigation devices.

B65-10105  
VARIABLE LOAD AUTOMATICALLY TESTS DC POWER  
SUPPLIES  
BURKE, H. C., JR. SULLIVAN, R. M. APR. 1965  
GSFC-291

Continuously variable load automatically tests dc power supplies over an extended current range. External meters monitor current and voltage, and multipliers at the outputs facilitate plotting the power curve of the unit.

B65-10108  
MAGNETIC FIELD CONTROLS CARBON ARC TAIL FLAME  
INNOVATOR NOT GIVEN /RCA/ APR. 1965  
MSC-139

Polarity of two electromagnets placed near the exhaust flue cancels out a high carbon-arc field. The arc tail flame is correctly drawn to the exhaust flue and contamination is diverted. This device should reduce maintenance cycles on any arc-powered illuminator.

B65-10112  
UNIUNCTION FREQUENCY DIVIDER IS FREE OF  
BACKWARD LOADING  
FAIRBANKS, A. F. APR. 1965  
JPL-W00-010

Simple frequency divider composed of relaxation oscillators uses unijunction transistors to reduce backward loading to a minimum. This circuit design is applicable in timing devices and sync generators for television systems.

B65-10118  
TRANSISTORIZED CIRCUIT CLAMPS VOLTAGE WITH  
0.1 PERCENT ERROR  
INNOVATOR NOT GIVEN /RCA/ APR. 1965  
GSFC-196

Transistorized clamping circuit clamps either of two voltage levels to input of digital-to-analog resistive matrix with 0.1 percent error. Clamping circuit technique has analog, digital, and hybrid circuit applications.

B65-10119  
VARIABLE FREQUENCY TRANSISTOR INVERTERS USE  
MULTIPLE CORE TRANSFORMERS  
INNOVATOR NOT GIVEN /DUKE UNIV./ APR. 1965  
GSFC-183

Magnetic-coupled multivibrators containing two or more square-loop cores with multiple windings in a single transformer package, provide indirect frequency control and improved operational characteristics. This multivibrator can be used for power oscillators, nonlinear magnetic circuitry and telemetry circuits.

B65-10120  
MULTIPLE TEST TUBES STIRRED MECHANICALLY

01 ELECTRICAL (ELECTRONIC)

LEON, H. J. STRONG, I. J. APR. 1965  
ARC-42

Mechanical device simultaneously stirs multiple test tubes under controlled laboratory conditions. The invention provides a variable stirring rate, minimal amount of contamination of tube contents, unattended and simple operation, and easy maintenance and cleaning.

B65-10123  
EFFICIENT THIN FILM HEATING ELEMENT TAKES  
MINIMUM SPACE  
BUSCH, A. H. APR. 1965  
GSFC-289

Light, thin-film heating element is formed by vacuum deposition of metal onto a nonconductive surface to be heated. This small-sized heater has a very fast response time.

B65-10124  
VARIABLE FREQUENCY MAGNETIC MULTIVIBRATOR  
GENERATES STABLE SQUARE-WAVE OUTPUT  
PAULL, S. MAY 1965  
GSFC-AE-21

Variable frequency magnetic multivibrator operates in a full wave fashion to provide a stable square wave output over wide variations in temperature and power supply potential. This invention is applicable in clocks and control devices.

B65-10125  
SIMPLIFIED ELECTROMETER HAS EXCELLENT  
OPERATING CHARACTERISTICS  
BRANTNER, R. E. MAY 1965  
JPL-413

Simplified and improved electrometer circuit provides high-input impedance, stability of gain and operating point, linear response, and low power requirements.

B65-10127  
TRAVELING-WAVE TUBE CIRCUIT SIMPLIFIES  
MICROWAVE RELAY  
ALLEN, W. K. IPPOLITO, L. J. NACE, D. A. MAY  
1965  
GSFC-299

Circuit with a sawtooth-modulated traveling-wave tube, which acts as a frequency converter and as an amplifier, simplifies microwave transmission. Lower power losses and reduced size and weight are also realized in this circuit.

B65-10128  
PIEZORESISTIVE GAGE TESTS PIN-CONNECTOR  
SOCKETS  
BOND, W. W. MAY 1965  
JPL-675

Connector pin consisting of a piezoresistive crystal, retainer spring and a bridge circuit with voltmeter is used to test connector sockets and may be adapted for multiple socket testing.

B65-10137  
INSTRUMENT CALIBRATES LOW GAS-RATE FLOWMETERS  
COPELAND, A. C. FULTON, W. C. SMITHER, M. A.  
MAY 1965  
MSC-134

Electronically measuring the transit time of a soap bubble carried by the gas stream between two fixed points in a burette calibrates flowmeters used for measuring low gas-flow rates.

B65-10138  
HIGH-GAIN AMPLIFIER HAS EXCELLENT STABILITY  
AND LOW POWER CONSUMPTION  
KLEINBERG, L. L. MAY 1965  
GSFC-272

Transistorized amplifier, in which an external reference voltage controls gain, combines high gain with stability and low power consumption. This circuit is useful in electronic servo and portable audio equipment.

B65-10139  
SPHERICAL ELECTRODE ELIMINATES HIGH-VOLTAGE  
BREAKDOWN  
FINKE, R. C. VETRONE, R. H. MAY 1965  
LEWIS-155

Spherical electrodes surrounding electrode-

dielectric junctions eliminate high-voltage breakdown. The gap between the spherical electrode and the dielectric must be of an optimum size for proper operation. Modified, this electrode should be suitable as a high-voltage feedthrough between various liquid and gaseous media.

B65-10142  
AUXILIARY CIRCUIT ENABLES AUTOMATIC MONITORING  
OF EKG'S  
INNOVATOR NOT GIVEN /TEX. INST. FOR  
REHABILITATION AND RES./ MAY 1965 SEE ALSO  
B65-10143 AND B65-10010  
MSC-106

Auxiliary circuits allow direct, automatic monitoring of electrocardiograms by digital computers. One noiseless square-wave output signal for each trigger pulse from an electrocardiogram preamplifier is produced. The circuit also permits automatic processing of cardiovascular data from analog tapes.

B65-10143  
DIGITAL-OUTPUT CARDIOTACHOMETER MEASURES RAPID  
CHANGES IN HEARTBEAT RATE  
VICK, H. MAY 1965 SEE ALSO B65-10010 AND  
B65-10142  
MSC-133

Cardiotachometer circuits produce an output voltage proportional to the heartbeat rate on a beat-by-beat basis. This is less complex and less costly than the digital cardiometers.

B65-10145  
LOGARITHMIC AMPLIFIER USES FIELD EFFECT  
TRANSISTORS  
STEWART, J. L. MAY 1965  
JPL-509

Solid-state amplifier utilizes field effect transistors and planar junction diodes to provide a logarithmic response to a wide range of input signals.

B65-10146  
FREQUENCY OFFSET IN LINEAR FM/CW TRANSPONDER  
ELIMINATES CLUTTER  
INNOVATOR NOT GIVEN /MELPAR/ MAY 1965  
M-FS-249

Clutter is eliminated by offsetting the frequency of a transponder signal with respect to an interrogation signal. This improves the tracking of aircraft and spacecraft by FM/CW transponders.

B65-10151  
ROTOR POSITION SENSOR SWITCHES CURRENTS IN  
BRUSHLESS DC MOTORS  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
MAY 1965  
GSFC-315

Reluctance switch incorporated in an induction motor is used for sensing rotor position and switching armature circuits in a brushless dc motor. This device drives the solar array system of an unmanned space satellite.

B65-10152  
CIRCUIT REDUCES DISTORTION OF FM MODULATOR  
INNOVATOR NOT GIVEN /RCA/ MAY 1965  
GSFC-257

Correction circuit improves the linearity of a voltage-variable capacitor used to modulate a free-running oscillator. This improvement only applies to audio frequency modulation and will not correct for slowly varying dc input in some telemetry systems.

B65-10158  
LASER BEAM TRANSMITS ELECTRIC POWER  
INNOVATOR NOT GIVEN /RCA/ JUN. 1965  
GSFC-293

Semiconductor laser beam supplies sustained level of electrical power to remote location not served by conventional conductors. This system would be useful where transmission of energy is critical, such as in nuclear reactors, or other hazardous environments.

**B65-10159**  
**SOLID-STATE SWITCHING USED TO SPEED UP CAPACITIVE INTEGRATOR**  
 NEWCOMB, A. L., JR. JUN. 1965  
 LANGLEY-104

Capacitive integrator circuit using silicon controlled switches /SCS/ insures output voltage linearly proportional to input pulse width. This circuit provides high input impedance and relatively low output impedance.

**B65-10161**  
**INTERFEROMETER COMBINES LASER LIGHT SOURCE AND DIGITAL COUNTING SYSTEM**  
 INNOVATOR NOT GIVEN /MIT/ JUN. 1965  
 MSC-151

Measurement of small linear displacements in digital readouts with extreme accuracy and sensitivity is achieved by an interferometer. The instrument combines a digital electro-optical fringe-counting system and a laser light source.

**B65-10165**  
**SUPERCONDUCTOR MAGNETS USED FOR STAGGER-TUNING TRAVELING-WAVE MASER**  
 INNOVATOR NOT GIVEN /RCA/ JUN. 1965  
 GSFC-292

Superconducting materials reduce size and weight of magnets used for stagger-tuning individual traveling-wave maser crystals. The invention is useful in microwave communication systems requiring a high information rate.

**B65-10169**  
**PHASE SHIFT FREQUENCY SYNTHESIZER IS EFFICIENT, SMALL IN SIZE**  
 INNOVATOR NOT GIVEN /SPACE TECH. LABS./ JUN. 1965  
 M-FS-250

Phase shift frequency synthesizer produces suppressed-carrier signals at the sum and difference frequencies. All unwanted frequencies are suppressed by this small-sized synthesizer.

**B65-10178**  
**INNOVATOR NOT GIVEN /DUKE UNIV./ JUN. 1965**  
 GSFC-130

Self-oscillating dc to ac converter with transistor switching to produce a square wave output is used for low and high voltage power sources. The converter has a high efficiency throughout a wide range of loads.

**B65-10182**  
**FORCE CONTROLLED SOLENOID DRIVES MICROWELD TESTER**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965  
 WOOD-125

Solenoid-driven device tests the integrity of a microweld joint between an electronic component lead wire and a wire ribbon by applying tension stress to the joint. Variable measured force is provided when either destructive or nondestructive testing is performed.

**B65-10183**  
**MODIFIED INTERELEMENT SPACING IMPROVES YAGI ANTENNA ARRAY**  
 BECK, F. B. JUN. 1965  
 LANGLEY-130

Symmetrical antenna array is designed by adjusting the Yagi disk interelement spacing so that the grating lobe of the array factor coincides with the first sidelobe of the element pattern.

**B65-10184**  
**PRESSURE SENSOR RESPONDS ONLY TO SHOCK WAVE**  
 INNOVATOR NOT GIVEN /BOEING CO./ JUN. 1965  
 M-FS-238

Pressure sensor responds only to high pressure crest of a shock wave, and will not respond to conditions of overpressure. The sensor uses plates of a battery to produce voltage output used to actuate an alarm signal or crew escape system.

**B65-10187**  
**CRYSTAL MEASURES--SHORT TERM, LARGE-MAGNITUDE FORCES**  
 PFEIFFER, C. G. JUN. 1965

JPL-77

By using the magnitude of piezoelectric crystal response to distortion and compression, this device measures transient accelerations and their rate of change. The invention could be used in a servo control system by supplementing the accelerometer and taking over its function when its range was exceeded.

**B65-10193**  
**LOGIC CIRCUIT EXHIBITS OPTIMUM PERFORMANCE**  
 HUSSON, C. JUN. 1965  
 LANGLEY-129

Performance of circuits are compared to determine the optimum circuit configuration for implementation into microelectronic functions. Comparison is made in terms of power drain, propagation time, and component variations with temperature and load.

**B65-10194**  
**ANALOG-TO-DIGITAL CONVERTER HAS INCREASED RELIABILITY AND REDUCED POWER CONSUMPTION**  
 THORNWALL, J. C. JUN. 1965  
 GSFC-246

Eight-bit analog-to-digital converter decreases average power consumption and increases component reliability. The converter uses solid-state components in pulse operation and magnetic core components for minimizing power consumption. The magnetic core components also increase reliability.

**B65-10195**  
**DEVICE MEASURES FLUID DRAG ON TEST VEHICLES**  
 FREEMAN, R. JUDD, J. H. LEISS, A. JUN. 1965  
 LANGLEY-34

Electromechanical drag balance device measures the aerodynamic drag force acting on a vehicle as it moves through the atmosphere and telemeters the data to a remote receiving station. This device is also used for testing the hydrodynamic drag characteristics of underwater vehicles.

**B65-10196**  
**INEXPENSIVE ELECTRICAL CONNECTOR IS MOISTURE AND CORROSIONPROOF**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965  
 MSC-164

Compression-sealed electrical connector made principally of plastic components is used in a corrosive atmosphere. This inexpensive and moistureproof connector can be modified to provide a multiple-pin connector.

**B65-10197**  
**IMPROVED SOLDERLESS CONNECTOR IS EASILY DISCONNECTED**  
 INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ JUN. 1965  
 JPL-SC-060

Compression type solderless connector is easily disconnected and reassembled and resists vibration. The connector, which uses a tapered, split sleeve that is tightened by a nut into a mating bug, is used in place of standard solder lugs and to connect unsolderable wire.

**B65-10199**  
**MODULAR THERMOELECTRIC CELL IS EASILY PACKAGED IN VARIOUS ARRAYS**  
 EPSTEIN, J. JUN. 1965  
 GSFC-339

Modular thermoelectric cells are easily packaged in various arrays to form power supplies have desirable voltage and current output characteristics. The cells employ two pairs of thermoelectric elements, each pair being connected in parallel between two sets of aluminum plates. They can be used as solar energy conversion devices.

**B65-10200**  
**DENSITY TRACE MADE WITH COMPUTER PRINTOUT**  
 WILSON, M. JUN. 1965  
 GSFC-322

Special drum for a computer-controlled printer improves density trace of scientific data. The

01 ELECTRICAL (ELECTRONIC)

drum provides uniformly shaped characters and evenly spaced variations of print density that precisely reflect data magnitude. This device plots temperature profiles, geographic contours, pressure gradients, electric potential gradients, and magnetic field configurations.

**B65-10202**  
**QUICK-DISCONNECT COUPLING SAFE TRANSFER OF HAZARDOUS FLUIDS**  
 DEWITT, R. L. SCHMIDT, H. W. JUN. 1965  
 LEWIS-125

Quick-disconnect coupling is used for uncoupling of plumbing during ground-to-vehicle transfer of cryogenic and hazardous fluids. The coupling allows remote positive control of liquid pressure and flow during the transfer operation, remote connection and separation capabilities, and negligible liquid spillage upon disconnection

**B65-10203**  
**TINY BIOMEDICAL AMPLIFIER COMBINES HIGH PERFORMANCE, LOW POWER DRAIN**  
 DEBOO, G. J. JUL. 1965  
 ARC-41

Transistorized, portable, high performance amplifier with low power drain facilitates biomedical studies on mobile subjects. This device, which utilizes a differential input to obtain a common-mode rejection, is used for amplifying electrocardiogram and electromyogram signals.

**B65-10204**  
**VOLTAGE VARIABLE OSCILLATOR HAS HIGH PHASE STABILITY**  
 HEARN, C. P. JUL. 1965  
 LANGLEY-123

Two or more series RLC circuits are used with a negative feedback amplifier to make a voltage variable oscillator. This combination results in high phase stability and optimum frequency modulation.

**B65-10206**  
**SENSITIVE ELECTROMETER FEATURES DIGITAL OUTPUT**  
 DOONG, H. JUL. 1965  
 GSFC-288

Four-stage transistorized electrometer eliminates the need for a logarithmic compression network. It measures very low currents and produces a digital output directly indicative of the input current magnitude.

**B65-10208**  
**HYBRID COMPUTER TECHNIQUE YIELDS RANDOM SIGNAL PROBABILITY DISTRIBUTIONS**  
 CAMERON, W. D. JUL. 1965  
 ARC-34

Hybrid computer determines the probability distributions of instantaneous and peak amplitudes of random signals. This combined digital and analog computer system reduces the errors and delays of manual data analysis.

**B65-10209**  
**OSCILLATOR CIRCUIT MEASURES LIQUID LEVEL IN TANKS**  
 INNOVATOR NOT GIVEN /IBM/ JUL. 1965  
 M-FS-245

Oscillator circuits automatically measure the liquid level in tanks. The circuit employs a twin transmission line as a liquid level probe.

**B65-10212**  
**DETECTOR CIRCUIT COMPENSATES FOR VIDICON BEAM CURRENT VARIATIONS**  
 INNOVATOR NOT GIVEN /RCA/ JUL. 1965  
 GSFC-310

Signal detector circuit compensates for black level shifts in vidicons by dark current cancellation. It clamps the video signal to the dark current component of the signal. The device also compensates for background noise variation or transducer bias fluctuations in other repetitive pulse systems.

**B65-10213**  
**MULTIAXIAL ANALYZER DETECTS LOW-ENERGY ELECTRONS**  
 LIND, D. L. OGILVIE, K. W. WILKERSON, T. D. JUL. 1965  
 GSFC-329

Three curved plate energy analyzers coupled with three electron multiplier tubes detect and measure low energy electron flux in several directions simultaneously.

**B65-10215**  
**ELECTRICAL PROBE ENSURES RELIABLE CONTACT IN SOCKET**  
 INNOVATOR NOT GIVEN /IBM/ JUL. 1965  
 M-FS-315

Spring-loaded probe makes a reliable electrical contact by producing a circular wiping motion at the tip when inserted into a mating socket.

**B65-10218**  
**GRAPHITE ELEMENT SERVES AS RADIANT HEAT SOURCE**  
 INNOVATOR NOT GIVEN JUL. 1965  
 M-FS-105

Radiators using a graphite heating element as a radiant heat source have high heat flux and long operational lives. They are used to test the thermal resistance of materials.

**B65-10221**  
**INSTRUMENT ACCURATELY MEASURES EXTREMELY LOW AIR DENSITIES**  
 INNOVATOR NOT GIVEN /ELECTRO-OPTICAL SYSTEMS/ AUG. 1965  
 M-FS-193

Gauge accurately measures low air densities in high-vacuum systems. It relies on the detection of near-visible light radiated from nitrogen molecules present in the system.

**B65-10223**  
**VOLTAGE CONTROLLED OSCILLATOR IS EASILY ALIGNED, HAS LOW PHASE NOISE**  
 SYDNOR, R. L. AUG. 1965  
 JPL-510

Voltage controlled oscillator /VCO/, represented by an equivalent rf circuit, is easily adjusted for optimum performance by varying the circuit parameter. It contains a crystal drive level which is also easily adjusted to obtain minimum phase noise.

**B65-10225**  
**SIMPLE BCD CIRCUIT ACCURATELY COUNTS TO 24**  
 SPAFFORD, M. L. AUG. 1965  
 GSFC-317

Ripple-through counter with divide-by-24 output pulse is used in digital control clocks to register hours and give a daily output signal. It uses commercially available digital modules that incorporate and-gates with flip-flops.

**B65-10226**  
**MAGNETIC-SHIFT-REGISTER CIRCUIT CONTROLS STEP MOTOR OPERATIONS**  
 VEILLETTE, L. J. AUG. 1965  
 GSFC-340

Magnetic-shift-register circuit controls bidirectional operations of a phase-pulsed step motor. The circuit draws no power in standby, is nonregenerative, and is insensitive to switching transients.

**B65-10228**  
**SIMPLE CIRCUIT PRODUCES HIGH-SPEED, FIXED DURATION PULSES**  
 GARRAHAN, N. M. AUG. 1965  
 GSFC-285

Circuit generates an output pulse of fixed width from a variable width input pulse. The circuit consists of a tunnel diode in parallel with an inductance driven by a constant current generator. It is used for pulsed communication equipment design.

**B65-10232**  
**FIELD EFFECT TRANSISTOR PRESENTS HIGH INPUT IMPEDANCE IN AC AMPLIFIER**  
 MARSHALL, J. H. AUG. 1965

JPL-500

Four-stage transistorized ac amplifier provides high input impedance and operates at low intrinsic noise levels. It is suited to carrier or narrow band sine wave applications.

B65-10233

HIGH-SPEED SQUARE-WAVE CURRENT LIMITER OPERATES EFFICIENTLY

INNOVATOR NOT GIVEN /LABKO SCI./ AUG. 1965  
JPL-SC-073

Transistorized high speed circuit limits currents from a square-wave ac power supply. The current limiter resets after each half cycle of the square wave and thus minimizes power losses.

B65-10234

SIMPLE CIRCUIT REDUCES TRANSISTOR SWITCHING TIME

INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
AUG. 1965  
GSFC-314

Silicon-controlled rectifier /SCR/, gated by a voltage divider, controls the potentiometer in transistorized switching circuits. The SCR acts as a gate to trigger the switching transistor only when the input signal reaches an amplitude that will switch the transistor rapidly.

B65-10237

BRUSHLESS DC MOTOR USES ELECTRON BEAM SWITCHING TUBE AS COMMUTATOR

STUDER, P. AUG. 1965  
GSFC-345

Electron beam switching tube eliminates physical contact between rotor and stator in brushless dc motor. The tube and associated circuitry control the output of a dc source to sequentially energize the motor stator windings.

B65-10238

SOLID-STATE LASER TRANSMITTER IS AMPLITUDE MODULATED

BILDERBACK, R. AUG. 1965  
MSC-121

Amplitude modulated laser transmitter affords radio frequencies unlimited bandwidth. The system, which is solid state and compact, uses a gallium arsenide diode that emits in the near infrared.

B65-10242

ELECTROMETER HAS AUTOMATIC ZERO BIAS CONTROL

INNOVATOR NOT GIVEN /APPLIED PHYSICS CORP./ AUG. 1965  
GSFC-350

Zero biasing circuit in a vibrating reed type electrometer counterbalances residual potential. It charges a capacitor to the residual potential and connects that capacitor in series with the vibrating reed so that the voltages cancel. This enables the electrometer to read zero output potential in the absence of an input current.

B65-10243

NOVEL PROBE SIMPLIFIES ELECTRONIC COMPONENT TESTING

SYNER, W. F.  
GSFC-342

Test probe, in conjunction with standard equipment, tests axial-lead electronic components in their original packages. The probe can be modified to test any electronic component with automatic or nonautomatic equipment.

B65-10244

LIGHTWEIGHT COAXIAL CABLE CONNECTOR REDUCES SIGNAL LOSS

BREJCHA, A. G., JR. AUG. 1965  
JPL-720

Connectors with milled interface surfaces for perfect electrical contact eliminate secondary-emission discharge and low signal loss in rf coaxial cables. The connectors which contain alignment and centering components for proper joint concentricity are used in communications systems designs.

B65-10247

SERVO CALORIMETER MEASURES MATERIAL HEATING RATE

GILMOUR, G. WILSON, J. H. /WESTINGHOUSE ELEC. CORP./ AUG. 1965  
NU-0024

Servo calorimeter accurately measures the heating rate of a material exposed to nuclear radiation independently of the specific heat and thermal conductivity of the material. The electrical power used is a direct measure of the nuclear heating rate.

B65-10249

MANUAL-FEED ADAPTER PERMITS MICROFILMING OF CONTINUOUS OSCILLOGRAPH OUTPUT

BENNETT, J. /WESTINGHOUSE ELEC. CORP./ AUG. 1965  
NU-0029

A manual-feed adapter used with a microfilm recording unit permits continuous filming and reduces oscillograph output to manageable dimensions.

B65-10255

BORON TRIFLUORIDE NUCLEAR DETECTOR

PREAMPLIFIER USES SINGLE-CABLE CONNECTION

HECKELMAN, J. D. SHUMAKER, R. E. AUG. 1965

LEWIS-178

Preamplifier for a nuclear particle detector operates with a single interconnecting cable. Isolating and bypass networks permit this single cable operation.

B65-10257

INDUCTOR FLYBACK CHARACTERISTIC GIVES VOLTAGE REGULATOR FAST RESPONSE

SMITH, G. D. AUG. 1965

GSFC-361

Voltage regulator alternately connects an inductor in parallel and in series with the input voltage source. This flyback voltage regulator provides a regulated dc voltage to varying loads from a varying dc supply and gives fast response to load and supply changes.

B65-10258

GAPPED TOROID PROVIDES INFINITE RESOLUTION OF DELAY-LINE PICKUP

ROBINSON, G. B. AUG. 1965

GSFC-370

Gapped toroid magnetically coupled to a delay line provides continuous adjustment of the time delay line signal retrieval. A rotating screw moves the toroid pickup parallel to the delay line. This device can be used in signal detection devices and instrumentation equipment.

B65-10259

INCREASED JUNCTION LEAD INDUCTANCE BALLASTS HIGH-FREQUENCY TRANSISTORS

GILBERT, G. J. /RCA/ SEP. 1965

GSFC-387

Segmentation of transistor bonding stripes and the inherent inductance of individual leads provides ballast for even current distribution across the junction of a high-frequency transistor.

B65-10260

SIMPLE PULSE COUNTING CIRCUIT COMPUTES SUM OF SQUARES

SCHAEFER, D. H. SEP. 1965

GSFC-391

Pulse counting circuit with an extra chain of flip-flops, delay lines, and and/gates computes the sum of the squares of the pulse sequences. A pulse train and the sum of the squares of the pulses are simultaneously completed.

B65-10263

INDEXING DEVICE ENSURES PROPER MATING OF ELECTRICAL CONNECTORS

JENKINS, L. M. JENKINS, S. M. SIMMONS, W. H.

SEP. 1965

MSC-155

Indexing splines with modified standard male and female connectors eliminates the possibility of incorrect mating. Large stock quantities of differently indexed connectors are unnecessary since connectors from a single stock can be

01 ELECTRICAL (ELECTRONIC)

indexed as desired at installation time.

B65-10264

PLASTIC BAGS IN EVACUATED CHAMBER MAKE  
LIGHTWEIGHT GAS SAMPLING SYSTEM  
SHAFFERNOCKER, W. M. /GE/ SEP. 1965  
FRC-31

Portable, lightweight system collects the exhaust gas of an aircraft during flight for use in analyzing combustion efficiency. The system uses an evacuated chamber and plastic bags.

B65-10265

WELD LEAKS RAPIDLY AND SAFELY DETECTED  
INNOVATOR NOT GIVEN /BOEING CO./ SEP. 1965  
M-FS-362

Test method detects leaks that occur during hydrostatic pressure testing of welded joints in metal tanks. A strip of aluminum foil and a strip of water-soluble paper are placed over the weld. A voltage applied between the tank wall and the foil strip is monitored to detect a decrease in ohmic resistance caused by water leakage into the paper layer.

B65-10267

ELECTROMETER PREAMPLIFIER HAS DRIFT CORRECTION  
FEEDBACK  
LABARTHE, L. C. /LABKO SCI./ SEP. 1965  
JPL-SC-074

Negative feedback circuit corrects output drift in an electrometer. The negative feedback is used in the no signal state to maintain the output level at zero reference. Drift voltage storage in the signal on state is also used to provide a drift-free readout.

B65-10268

MULTIPLE TEST CHAMBER EXPOSES MATERIALS TO  
VARIOUS ENVIRONMENTS  
JOHNSTON, R. L. SEP. 1965  
MSC-179

Multiple compartment test chamber exposes several material specimens to various environmental conditions for prolonged periods. The specimens are individually mounted in chamber compartments, rotated to various positions, and measured through optical windows to determine progressive changes in the material properties.

B65-10269

SIMPLE DEVICE PRODUCES ACCELEROMETER  
CALIBRATION PULSE  
INNOVATOR NOT GIVEN /LOCKHEED MISSILES AND SPACE  
CO./ SEP. 1965  
M-FS-363

Shock-impulse exciter produces a remote checkout of the amplitude calibration and frequency response of a piezoelectric vibration accelerometer. The exciter employs a bimetal spring to apply a mechanical acceleration pulse of a known amplitude and frequency to the accelerometer.

B65-10271

COMPOSITE SEAL REDUCES ALKALINE BATTERY  
LEAKAGE  
CLATTERBUCK, C. H. PLITT, K. F. SEP. 1965  
GSFC-337

Composite seal consisting of rubber or plastic washers and a metal washer reduces alkaline battery leakage. Adhesive is applied to each washer interface, and the washers are held together mechanically.

B65-10273

ELECTROMECHANICAL FLOWMETER ACCURATELY  
MONITORS FLUID FLOW  
GRANT, D. J. SEP. 1965  
GSFC-357

Electromechanical flowmeter remotely and accurately monitors the flow rate and total volume of a transparent liquid discharged from a dispensing system. A dual dispensing tube system provides a relative reference level which permits compensation for temperature variations.

B65-10274

ELECTRONIC OHMMETER PROVIDES DIRECT DIGITAL

OUTPUT

SEMYAN, J. SEP. 1965  
GSFC-363

Self-balancing wheatstone bridge acts as all-electronic digital readout ohmmeter

B65-10275

IMPROVED CIRCUIT MINIMIZES GENERATION OF  
PSEUDONOISE CHECK BITS  
ANDERSON, T. O. LUSBAUGH, W. A. SEP. 1965  
JPL-698

Computer switching network consists of parallel and series combinations of mod 2 adders using the minimum number of gating levels. This network minimizes the propagation time in which a sequence of pseudonoise check bits are generated.

B65-10276

ADDED DIODES INCREASE OUTPUT OF BALANCED  
MIXER CIRCUIT  
ROBINSON, G. B. SEP. 1965  
GSFC-354

Two diodes added to a conventional balanced mixer circuit increase the output signal level. The resulting half-wave carrier switch balanced modulator is used in radio equipment.

B65-10277

NONLINEAR FEEDBACK REDUCES ANALOG-TO-DIGITAL  
CONVERTER ERROR  
MUNOZ, R. M. SEP. 1965  
ARC-46

Nonlinear analog-to-digital converter measures the analog input level and continuously adjusts the digital readout scale sensitivity to effectively increase the accuracy. It is able to acquire more accurate low-level data.

B65-10278

MODIFIED DEVELOPER INCREASES LINE RESOLUTION  
IN PHOTSENSITIVE RESIST  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
SEP. 1965  
GSFC-386

Standard developer solution is mixed with dipropyl carbonate. This reduces swelling in the photosensitive resist and permits application of relatively thick films with minimal pinhole formation and increased line resolution.

B65-10279

INFLATABLE BLADDER PROVIDES ACCURATE  
CALIBRATION OF PRESSURE SWITCH  
SMITH, N. J. /BOEING CO./ SEP. 1965  
M-FS-367

Calibration of a pressure switch is accurately checked by a thin-walled circular bladder. It is placed in the pressure switch and applies force to the switch diaphragm when expanded by an external pressure source. The disturbance to the normal operation of the switch is minimal.

B65-10281

CIRCUIT MAINTAINS DIGITAL DECISION THRESHOLD  
AT PRESET LEVEL  
INNOVATOR NOT GIVEN /AVCO CORP./ SEP. 1965  
M-FS-331

Optimum decision-level circuit maintains the decision threshold at any preselected percentage of the input-signal amplitude. Communications equipment involving recognition of transmitted digital information can benefit from this circuit

B65-10282

CONSTANT-CURRENT REGULATOR IMPROVES TUNNEL  
DIODE THRESHOLD-DETECTOR PERFORMANCE  
CANCRO, C. A. SEP. 1965  
GSFC-239

Grounded-base transistor is placed in a tunnel diode threshold detector circuit, and a bias voltage is applied to the tunnel diode. This provides the threshold detector with maximum voltage output and overload protection.

B65-10284

FIELD-EFFECT TRANSISTOR REPLACES BULKY  
TRANSFORMER IN ANALOG-GATE CIRCUIT  
INNOVATOR NOT GIVEN /RADIATION, INC./ SEP. 1965  
GSFC-351

Metal-oxide semiconductor field-effect transistor /MOSFET/ analog-gate circuit adapts well to integrated circuits. It provides better system isolation than a transformer, while size and weight are appreciably reduced.

**B65-10286**  
UPPERCASE AND LOWERCASE COMPUTER PRINTOUT  
INCREASES READABILITY

HAND, W. W. JONSBURG, M. B. /DOC., INC./ SEP. 1965  
HQ-12

Print chain of 120 characters facilitates production of computer printout in both uppercase and lowercase characters. Although the output speed is reduced, the use of the print chain increases the computer printout readability.

**B65-10287**  
PHOTORESISTANCE ANALOG MULTIPLIER HAS WIDE RANGE

HARTENSTEIN, R. G. SEP. 1965  
GSFC-360

Photoactivated bridge facilitates equal performance of analog multipliers over a wide frequency range. The multiplier operates from direct current to an upper frequency limited by either the light source or the closed-loop amplifier.

**B65-10289**  
BORON NITRIDE HOUSING COOLS TRANSISTORS  
INNOVATOR NOT GIVEN /SPACE TECHNOL. LABS./ SEP. 1965  
SEE ALSO B63-10033 AND B65-10186  
W00-079

Boron nitride ceramic heat sink cools transistors in rf transmitter and receiver circuits. Heat dissipated by the transistor is conducted by the boron nitride housing to the metal chassis on which it is mounted.

**B65-10290**  
FM/CW SYSTEM MEASURES AIRCRAFT ATTITUDE  
INNOVATOR NOT GIVEN /HELPA/ SEP. 1965  
M-FS-276

FM/CW radar system measures attitude of an approaching aircraft relative to a ground station. The FM/CW transmitter on board the aircraft transmits through two antennas to a ground-based receiver.

**B65-10293**  
ELECTROSTATICALLY DRIVEN DYNAMIC CAPACITOR  
EMPLOYS CAPACITIVE FEEDBACK  
LONBORG, J. O. OCT. 1965  
JPL-771

Three-part signal electrode provides capacitive feedback to an oscillator driven dynamic capacitor in an electrometer circuit.

**B65-10298**  
TITANIUM DIAPHRAGM MAKES EXCELLENT AMPLITRON  
CATHODE SUPPORT  
TEICH, W. W. /RAYTHEON CO./ OCT. 1965  
GSFC-394

Cathode support structure designed around a titanium diaphragm prevents radial misalignment between the cathode and anode in amplitrons. The titanium exhibits low thermal conductivity, tolerates lateral thermal expansion of the cathode, and is a poor primary and secondary emission medium.

**B65-10299**  
ELECTROPNEUMATIC RHEOSTAT REGULATES HIGH CURRENT  
HAACKER, J. F. JEDLICKA, J. R. WAGONER, C. B. OCT. 1965  
ARC-44

Electropneumatic rheostat maintains a constant direct current in each of several high-power parallel loads, of variable resistance, across a single source. It provides current regulation at any preset value by dissipating the proper amount of energy thermally, and uses a column of mercury to vary the effective length of a resistance element.

**B65-10300**  
IMPURITY DIFFUSION PROCESS FOR SILICON  
SEMICONDUCTORS IS FAST AND PRECISE  
MC LOUSKI, R. M. SKOUSDON, G. W. /WESTINGHOUSE  
ELEC. CORP./ OCT. 1965  
GSFC-397

Impurity diffusion process produces precision silicon semiconductor junctions economically and fast. Oxide is deposited on a silicon wafer and a controlled concentration of impurity atoms in gaseous form is simultaneously introduced into the reaction.

**B65-10301**  
REMOTE RAPIDLY VARYING PRESSURES ACCURATELY  
MEASURED  
INNOVATOR NOT GIVEN /GE/ OCT. 1965  
FRC-28

Transmitting-damping tube with one end closed, the other open to a pressure source, has a pressure sensor connected to a port close to the pressure source. This accurately measures transient or rapidly varying fluid pressures.

**B65-10304**  
IMPROVED STRAIN-WIRE FLOWMETER HAS FAST  
RESPONSE TIME  
DILLON, R. C. DUNBAR, W. R. OCT. 1965  
LEWIS-241

Strain-sensitive resistance wires in a Wheatstone bridge arrangement form the sensing element of a flowmeter. The change in resistance of the wires is measured as a function of stream velocity. Thus the electrical output is a measure of both rapidly varying and steady fluid-flow rates.

**B65-10305**  
THIN-FILM RESISTORS USED IN FUNCTIONAL  
ELECTRONIC BLOCKS  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
OCT. 1965  
GSFC-380

Vapor-deposited thin-film resistors replace diffused resistors in R-C tank circuits in a solid state electronic block. This allows an optimum parallel capacitance to be obtained for circuit applications requiring a high resistance and a low capacitance.

**B65-10306**  
OPAQUE MICROFICHE MASTHEAD PERMITS EASY  
READING  
LOWE, E. M. /DOC., INC./ OCT. 1965  
HQ-7

White-pigmented backing applied to the reverse side of microfiche mastheads makes the area opaque and easily readable. This technique is of value for organizations involved in large volume information storage and retrieval.

**B65-10307**  
FREQUENCY CORRECTION DEVICE USES DIGITAL  
CIRCUITRY  
SCHAEFER, D. OCT. 1965  
GSFC-268

Signal acquisition and tracking system covering a wide range of frequencies uses a digital circuit to sample the frequency of an incoming signal and provide correction pulses to the voltage-controlled oscillator. The circuit can also sense the presence of a signal on any one of the input lines.

**B65-10308**  
ELECTRONIC AMPERE-HOUR INTEGRATOR IS ACCURATE  
TO ONE PERCENT  
PAULKOVICH, J. OCT. 1965  
GSFC-203

Electronic ampere-hour integrator is based on current-to-frequency conversion. It operates on low power and is accurate to one percent. This device can measure the ampere-hour capacity of batteries and can be adapted for other functions.

**B65-10309**  
THERMOELECTRIC ELEMENTS DIFFUSION-BONDED TO  
TUNGSTEN ELECTRODES  
INNOVATOR NOT GIVEN /TYCO LABS./ OCT. 1965  
SEE ALSO B65-10220

01 ELECTRICAL (ELECTRONIC)

GSFC-346

Solid-state diffusion process bonds lead telluride and lead telluride-tin telluride thermoelectric elements to tungsten electrodes. The resulting bond is nonmagnetic and has high strength and low electrical and thermal resistance. This method is also used with tantalum electrodes.

B65-10310

THRESHOLD DETECTOR PRODUCES NARROW PULSES AT HIGH REPETITION RATES

GARRAHAN, N. M. OCT. 1965  
GSFC-383

Solid state device generates fixed width output pulses from variable width input pulses in the nanosecond range. The circuit produces pulse repetition rates in the megacycle range and exhibits low power drain.

B65-10311

PCM MAGNETIC TAPE SYSTEM EFFICIENTLY RECORDS AND REPRODUCES DATA

COLE, P. T. OCT. 1965  
GSFC-375

Split-phase PCM technique consists of data and clock signal recording and reproduction systems. This PCM magnetic tape system achieves a high packing density on the tape and provides a symmetrical reproduction of the recorded signal.

B65-10313

PLANETARY CAMERA CONTROL IMPROVES MICROFICHE PRODUCTION

CHESTERTON, W. L. LEWIS, E. B. /DOC., INC./ OCT. 1965  
HQ-1 HQ-5

Microfiche is prepared using an automatic control system for a planetary camera. The system provides blank end-of-row exposures and signals card completion so the legend of the next card may be photographed.

B65-10314

HYBRID CIRCUIT ACHIEVES PULSE REGENERATION WITH LOW POWER DRAIN

CANCRO, C. A. OCT. 1965  
GSFC-382

Hybrid tunnel diode-transistor circuit provides a solid-state, low power drain pulse regenerator, frequency limiter, or gated oscillator. When the feedback voltage exceeds the input voltage, the circuit functions as a pulse normalizer or a frequency limiter. If the circuit is direct coupled, it functions as a gated oscillator.

B65-10315

MAGNETOMETER MEASURES ORTHOGONAL COMPONENTS OF MAGNETIC FIELDS

INNOVATOR NOT GIVEN /SPECTRA PHYS./ OCT. 1965  
GSFC-395

Driven magnetometer accurately measures the components of a low strength magnetic field in each of three mutually perpendicular directions. To accomplish this, it employs the principle of magnetic resonance in optically pumped rubidium vapor.

B65-10317

INSTRUMENT PERFORMS NONDESTRUCTIVE CHEMICAL ANALYSIS, DATA CAN BE TELEMETERED

TURKEVICH, A. /CHICAGO UNIV./ OCT. 1965  
JPL-SC-078

Instrument automatically performs a nondestructive chemical analysis of surfaces and transmits the data in the form of electronic signals. It employs solid-state nuclear particle detectors with a charged nuclear particle source and an electronic pulse-height analyzer.

B65-10318

REMOTE CONTROL ELECTRICAL SWITCHING SYSTEM HAS 1000-OUTPUT CAPABILITY

INNOVATOR NOT GIVEN /IBM/ OCT. 1965  
M-FS-380

Electromechanical remote control system has a capacity of 1000 individual on-off functions yet uses only seven pairs of telephone-type lines for interconnection. Installation and maintenance costs are decreased by using this system.

B65-10320

RUGGED PRESSED DISK ELECTRODE HAS LOW CONTACT POTENTIAL

DAY, J. L. MOSIER, B. /INST. OF RES. AND INSTRUMENTATION/ OCT. 1965 SEE ALSO B64-10025  
MSC-158

Pressed-disk electrode with low contact potential monitors physiological processes. It consists of silver and silver chloride combined with bentonitic clay. The clay affords a surface that permits use over extended periods without contact deterioration.

B65-10322

CAM-OPERATED LIMIT SWITCH FEATURES SAFE FUSE REPLACEMENT

WEBER, G. J. /MCDONNELL AIRCRAFT CORP./ OCT. 1965  
MSC-218

Two hermetically sealed, short travel, limit switches permit fuse replacement without danger of a spark or arcing. The switches are wired in parallel circuits and actuated by manually operated cams containing the circuit fuses.

B65-10324

SELENIUM BOND DECREASES ON RESISTANCE OF LIGHT-ACTIVATED SWITCH

INNOVATOR NOT GIVEN /IBM/ NOV. 1965  
JPL-SC-101

Vitrified amorphous selenium bond decreases the ON resistance of a gallium arsenide-silicon light-activated, low-level switch. The switch is used under a pulse condition to prolong switch life and minimize errors due to heating, devitrification, and overdrawing.

B65-10325

DIRECT FORCE-MEASURING TRANSDUCER USED IN BLOOD PRESSURE RESEARCH

EIGE, J. J. /STANFORD RES. INST./ NEWGARD, P. M. PRESSMAN, G. L. NOV. 1965  
ARC-53

Direct force-measuring transducer acts as an arterial tonometer, gives a direct readout to instrumentation, and is unaffected by ambient noise. It uses a semiconductor strain gauge which is deflected by pressure pulses in the artery. The deflection changes the resistance of the gauge and alters the voltage reading on the associated instrumentation.

B65-10328

FEED-THROUGH CONNECTOR WITHSTANDS HIGH TEMPERATURES IN VACUUM ENVIRONMENT

KREISMAN, W. S. /GEOPHYS. CORP. OF AM./ NOV. 1965  
GSFC-442

Feed-through connector with sealing action augmented by any temperature increase can be used through the wall of a vacuum device. It retains vacuum integrity through successive cycles of high temperature.

B65-10329

BAKING ENABLES MCLEOD GAUGE TO MEASURE IN ULTRAHIGH VACUUM RANGE

KREISMAN, W. S. /GEOPHYS. CORP. OF AM./ NOV. 1965  
GSFC-440

Accurate measurements in the ultrahigh vacuum range by a conventional McLeod gauge requires degassing of the gauge's glass walls. A closed system, in which mercury is forced into the gauge by gravity alone, and in which the gauge components are baked out for long periods, is used to achieve this degassing.

B65-10333

COMMUNICATION SYSTEM USES MODULATED LASER BEAM

MINOTT, P. D. NOV. 1965  
GSFC-377

Electro-optical system is placed on a satellite to effect communications between two remote stations. The system employs an essentially passive, retrodirective, laser beam modulator-reflector.

B65-10334

FREQUENCY DIVIDER IS FREE OF SPURIOUS OUTPUTS

MC DERMOND, D. NOV. 1965  
GSFC-308

Frequency divider provides sixteen output states free of spurious pulses from four input circuits. The input is binary coded, and a change of one in the input only changes the number of output states by one.

B65-10340  
MINIATURE SERVO ACCELEROMETER IS FORCE-BALANCED

JOHNSTON, A. R. /CALIF. INST. RES. FOUND./ NOV. 1965  
JPL-155

Miniature servo accelerometer measures unusually small forces or torques. The pendulous mass of the accelerometer is suspended by fused quartz torsion fibers in an electromagnetically force-balanced environment. It is used in gravity surveys for exploring mineral deposits.

B65-10343  
DELAYED RIPPLE COUNTER SIMPLIFIES SQUARE-ROOT COMPUTATION

CLIFF, R. NOV. 1965  
GSFC-398

Ripple subtract technique simplifies the logic circuitry required in a binary computing device to derive the square root of a number. Successively higher numbers are subtracted from a register containing the number out of which the square root is to be extracted. The last number subtracted will be the closest integer to the square root of the number.

B65-10345  
VARIABLE WORD LENGTH ENCODER REDUCES TV BANDWIDTH REQUIREMENTS

SIVERTSON, W. E., JR. NOV. 1965  
LANGLEY-87

Adaptive variable resolution encoding technique provides an adaptive compression pseudo-random noise signal processor for reducing television bandwidth requirements. Complementary processors are required in both the transmitting and receiving systems. The pretransmission processor is analog-to-digital, while the postreception processor is digital-to-analog.

B65-10347  
COMPACT SCR TRIGGER CIRCUIT FOR IGNITRON SWITCH OPERATES EFFICIENTLY

FOSTER, L. E. NOV. 1965  
M-FS-371

Trigger circuit with two series-connected SCR triggers an ignitron switch used to discharge high-energy capacitor banks. It does not require a warmup period and operates at relatively high efficiency.

B65-10349  
FREQUENCY DISCRIMINATOR WITH BINARY OUTPUT ELIMINATES TUNED CIRCUITS

DE VELDE, E. /IBM/ NOV. 1965  
M-FS-376

Frequency discriminator has a binary output and permits microminiaturized packaging techniques. It uses a bandpass amplifier and standard logic elements that convert two input frequencies into two discrete logic pulses.

B65-10350  
ZENER DIODE CONTROLS SWITCHING OF LARGE DIRECT CURRENTS

INNOVATOR NOT GIVEN /IBM/ NOV. 1965  
MSC-188

High-current zener diode is connected in series with the positive input terminal of a dc supply to block the flow of direct current until a high-frequency control signal is applied across the zener diode. This circuit controls the switching of large dc signals.

B65-10352  
VIBRATING DIAPHRAGM MEASURES HIGH ELECTROSTATIC FIELD STRENGTHS

INNOVATOR NOT GIVEN /ELECTRO-OPT. SYSTEMS/ NOV. 1965

MSC-189

Meter with flexible conductive diaphragm measures electrostatic charge density on a conducting surface in a vacuum. The diaphragm is supported from an insulated conductive support ring rigidly attached to the conductive surface whose electrostatic charge density is to be measured.

B65-10353  
MULTIPHASE CLOCK-PULSE GENERATOR USES SIMPLIFIED CIRCUITRY

INNOVATOR NOT GIVEN /IBM/ NOV. 1965  
M-FS-297

Multiphase clock-pulse generator converts a simple pulse train into nonoverlapping clock pulses. The generator employs multistable circuits to minimize the number of electronic components.

B65-10355  
SIMPLE CIRCUIT PERFORMS BINARY ADDITION AND SUBTRACTION

CLIFF, R. A. SCHAEFER, D. H. NOV. 1965  
GSFC-399

Ripple adder reduces the number of logic circuits required to perform binary addition and subtraction. The adder uses dual input and delayed output flip flops in one register. The contents of this register are summed with those of a standard register through conventional AND gates.

B65-10359  
IMPROVED WIRE MEMORY MATRIX USES VERY LITTLE POWER

FEDDE, G. A. /SPERRY RAND CORP./ NOV. 1965  
JPL-SC-167

Thin-film, plated-wire memory matrix for computer applications requires little power yet has higher speed and four times greater storage capacity than ferrite-core memories of the same size.

B65-10361  
HIGH-INTENSITY FLASHING BEACON POWERED BY MERCURY CELLS

INNOVATOR NOT GIVEN NOV. 1965  
LANGLEY-80

Pair of xenon flashlamps powered by mercury batteries in a transistorized circuit provides a flashing beacon with an effective intensity of a second-magnitude star at a distance of ten statute miles. This beacon is lightweight, long lasting and it withstands shock and vibration.

B65-10362  
TEMPERATURE TRANSDUCER HAS HIGH OUTPUT, IS TIME STABLE

FOLLETT, W. H. /BALL BROTHERS RES. CORP./ NOV. 1965

GSFC-446

Compact, lightweight temperature transducer requires no amplification of its output signal and is time stable. It uses the temperature-dependent characteristics of a silicon transistor to provide a zero-to-five-volt signal proportional to temperature.

B65-10363  
REGENERATIVE FUEL CELL COMBINES HIGH EFFICIENCY WITH LOW COST

DOYLE, H. FRANK, H. STEPHENS, C. W. /ELECTRO-OPT. SYSTEMS/ DEC. 1965

WOO-090

Hydrogen/oxygen regenerative fuel cell stores electrical energy efficiently and inexpensively. The fuel cell has a high energy-to-weight ratio, and is adapted for a large number of cycles with deep discharge

B65-10365  
BLOOD-PRESSURE MEASURING SYSTEM GIVES ACCURATE GRAPHIC OUTPUT

INNOVATOR NOT GIVEN /GARRETT CORP./ DEC. 1965  
MSC-191

Electronic blood-pressure system provides an external measurement of arterial blood pressure in the form of an easily interpreted graphic trace. The system employs a standard occluding cuff, a gas-pressure valve, and an electronic timer and cycle-control circuit.

## 02 ENERGY SOURCES

B65-10369

RESPIRATORY TRANSFER VALVE HAS FAIL-SAFE FEATURE  
PUCCINELLI, A. A. SMITH, J. R., JR. DEC. 1965  
ARC-1

Quick-acting, remote controlled valve connects either one of two oxygen or air supplies to a breathing tube. The valve, which is fail-safe, incorporates a cammed piston arrangement that is driven by a remote controlled reversible rotary solenoid or reversible electric motor.

B65-10376

THREE-POSITION ROCKER SWITCH ACTUATOR HAS POSITIVE CENTERING  
BOGLEY, R. L. /N. AM. AVIATION/ DEC. 1965  
MSC-261

Three-position rocker switch actuator provides positive center positioning to inhibit possible override. Switch position is visually identified by rocker position, and functions can be shown on tabs and bars.

B65-10377

BINARY COUNTER USES FLUID LOGIC ELEMENTS  
INNOVATOR NOT GIVEN /RAND CORP./ DEC. 1965  
M-FS-323

Binary counter with two fluid flip-flops in each stage has an output taken from the output of the second flip-flop. The flip-flops each contain three fluid logic elements.

B65-10379

THREE-DIMENSIONAL WIRE-MESH CAPACITOR SYSTEM MEASURES FLUID DENSITY  
INNOVATOR NOT GIVEN /GARRETT CORP./ DEC. 1965  
W00-194

Gaging system automatically measures the bulk density of a stored, electrically nonconductive fluid containing varying portions of liquid and vapor. The system employs a three-dimensional wire-mesh capacitor whose capacitance varies with the bulk density of the fluid dielectric medium between the capacitor plates.

B65-10380

DEVICE DETECTS UNBONDED AREAS IN PLASTIC LAMINATES  
INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ DEC. 1965  
W00-206

Device generates an acoustic signal whose frequency changes disclose the presence of delaminated or unbonded areas in plastic laminates. A microphone makes the frequency change audible.

B65-10381

KEYED PLUGS AND SOCKETS PREVENT IMPROPER CONNECTIONS  
BUCKEY, D. L. LANKFORD, H. /MCDONNELL AIRCRAFT CORP./ DEC. 1965  
MSC-231

Plugs and sockets individually keyed so that no plug can be mated with other than its proper socket facilitates multiple connection in electrical systems.

B65-10382

PHOTOELECTRIC SYSTEM CONTINUOUSLY MONITORS LIQUID LEVEL  
INNOVATOR NOT GIVEN /BOEING CO./ DEC. 1965  
M-FS-417

Immersion probe presents a depth-sensitive optical transmission path between a light source and a photoelectric cell to continuously monitor the level of a transparent liquid in a tank. This system operates automatically, without moving parts, and provides output signals to a remote recorder.

B65-10387

SHRINKABLE SLEEVE ELIMINATES SHIELDING GAP IN RF CABLE  
INNOVATOR NOT GIVEN /GEN. DYN./CONVAIR/ DEC. 1965  
W00-207

RF shielding gap between an RF cable and a multipin connector is eliminated by a sleeve assembly installed between the connector and the terminated portion of the shielding. The assembly is enclosed in a heat-shrinkable plastic

sleeve which completes the continuous RF shield.

B65-10389

INSULATOR-HOLDER PROTECTS TRANSISTORS IN DENSE ELECTRONIC ASSEMBLIES  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ DEC. 1965  
MSC-214

Molded insulating spacer with one or more cavities is used as an insulated holder for mounting metal-case transistors in a chassis containing densely packed electronic components. The transistors are mechanically supported on their bases and electrically isolated from each other by the holder.

B65-10392

NONCONTACTING VIBRATION TRANSDUCER HAS CONSTANT SENSITIVITY  
FLAGGE, B. DEC. 1965  
LANGLEY-99

Noncontacting transducer with constant sensitivity automatically measures the vibration amplitudes along the span of a vibrating structure of irregular contour. A system employing a feedback control positions the transducer at a constant height above the test surfaces. A differential transformer facilitates calibration and extends the amplitude range of the system.

B65-10396

ADHESIVE-BACKED TERMINAL BOARD ELIMINATES MOUNTING SCREWS  
INNOVATOR NOT GIVEN /N. AM. AVIATION/ DEC. 1965  
MSC-173

Low-profile terminal board is used in dense electronic circuits where mounting and working space is limited. The board has a thin layer of pressure-sensitive adhesive backing which eliminates the need for mounting screws.

B65-10399

BINARY COUNTER ACCUMULATES TIME BY COMPLEMENTARY PRESET  
MARRINER, G. E. /N. AM. AVIATION/ DEC. 1965  
MSC-242

Binary counter reduces the number of logic elements required to furnish electrical control functions. The counter is automatically preset to the complement of the desired time increments in milliseconds. An output pulse is produced each time it reaches its capacity.

B65-10400

ELECTRICALLY HEATED DIAPHRAGM ELIMINATES USE OF PYROTECHNICS  
MATHEWSON, R. C. /N. AM. AVIATION/ DEC. 1965  
MSC-241

Membrane-type diaphragm is used in systems where fluids are contained under pressure until a certain pressure threshold or point of time has been reached when the fluids are automatically released. The diaphragm is resistance heated until its strength is degraded to the point of rupture, thus releasing the contained fluids.

## 02 ENERGY SOURCES

B63-10260

SOLAR-ANGLE SENSOR HAS NO MOVING PARTS  
EXNER, D. W., JR. MEISENHOLDER, G. W. SCHMIDT, L. F. MAY 1964  
JPL-418

To measure the direction of the sun over a spherical field of view, a cube-shaped solar sensor with a photocell on each side is used. The outputs from the six cells are fed into a computer for determining the position of the sun relative to an orthogonal coordinate system.

B63-10344

COOLING METHOD PROLONGS LIFE OF HOT-WIRE TRANSDUCER  
BALDWIN, L. V. SANDBORN, V. A. JUN. 1964  
LEWIS-41

To cool a hot-wire transducer, the two ends of the

wire are supported on thermally and electrically conductive rods, surrounded by a fluid cooling medium. By keeping the supporting rods at a substantially constant temperature, the probe is prevented from overheating.

**B63-10346**  
NEW METHOD USED TO FABRICATE LIGHT-WEIGHT HEAT EXCHANGER FOR ROCKET MOTOR  
BAEHR, E. F. MAR. 1964  
LEWIS-43

A grooved capstrip, to straddle the metal edges of regenerative cooling channels, increases the strength and heat transfer characteristics of lightweight motor cases. This capstrip is so designed as to form a firm joint between the channels that form the rocket casing wall.

**B63-10421**  
MIRROR DEVICE ALIGNS MACHINE SURFACE PERPENDICULAR TO SIGHT LINES  
INNOVATOR NOT GIVEN /JPL/ MAY 1964  
WOOD-5

A sight alignment device is used to align two machines so that an axis of the first machine is parallel to a flat surface on the second. This sighting device depends on the reflection of a light beam from the surface to be aligned.

**B65-10036**  
IONIZATION VACUUM GAGE STARTS QUICKLY, IS UNAFFECTED BY SPURIOUS CURRENTS  
GARWOOD, D. C. FEB. 1965  
JPL-304

Ionization vacuum gauge with a switch-operated starting device and a microammeter begins functioning quickly in a high vacuum. The microammeter is also protected by its circuit design from spurious currents.

**B65-10046**  
WIDE-APERTURE SOLAR ENERGY COLLECTOR IS LIGHT IN WEIGHT  
INNOVATOR NOT GIVEN /BECKMAN INSTRUMENTS/ FEB. 1965  
JPL-SC-055

By mounting the Fresnel lens in eight steps above three paraboloidal reflector rings of epoxy resin with aluminized surfaces, a light weight, wide-aperture solar energy collector is devised.

**B65-10071**  
SIMPLE OPTICAL SYSTEM USED TO ALIGN SPECTROGRAPH  
EXTON, R. J. MAR. 1965  
LANGLEY-92

Optically fast, portable spectrograph incorporates auxiliary optics in a boresight technique to use the zero order of the grating for visual alignment. This device obtains moderately resolved spectra of a multitude of light sources.

**B65-10081**  
MAGNETIC FIELD TEST COILS ARE TEMPERATURE COMPENSATED  
INNOVATOR NOT GIVEN /SPECTRA PHYS./ APR. 1965  
GSFC-294

Magnetic field test coils with auxiliary winding wound opposite to main coil winding eliminates changes in field configurations due to temperature changes. The auxiliary coil is made with aluminum wire.

**B65-10082**  
MULTIPLE ELEMENT SOFT X-RAY SOURCE PRODUCES WIDE RANGE OF RADIATION  
CARUSD, A. J. NEUPERT, W. M. MAR. 1965  
GSFC-286

A rotating mount with target elements positioned independently for direct electron bombardment produces soft X-ray radiation with a wide range of characteristics. The device may be used to study solar radiation from a satellite.

**B65-10084**  
MODIFIED CONTOUR PROJECTOR MAKES EXCELLENT CONTOUR DENSITOMETER  
EXTON, R. J. MAR. 1965  
LANGLEY-93

Thin glass beam splitter, densitometer head, and densitometer electronics are incorporated in a standard contour projector. The density contour of small areas of photographic film can be read. This instrument can be used as a research tool in process engineering.

**B65-10100**  
ROTATING FILTERS PERMIT WIDE RANGE OF OPTICAL PYROMETRY  
EXTON, R. J. SIVITER, J. H., JR. STRASS, H. K. APR. 1965  
LANGLEY-33

Gear-driven dual filter disks of graduated density vary linearly with respect to rotation, allowing a wide range of photographic pyrometry. This technique is applicable in metallurgy, glass, plastics and refractory research, and crystallography.

**B65-10122**  
MICROWAVE TECHNIQUE MEASURES PLASMA CHARACTERISTICS  
LEONARD, W. F. APR. 1965  
LANGLEY-134

Plasma electron density and temperature distribution is measured by passing a high frequency millimeter wave through plasma. Variations in density and temperature are determined by measuring insertion loss as the plasma travels between the microwave transmitting and receiving antennas

**B65-10129**  
APPARATUS PERMITS FLEXURE TESTING OF SPECIMENS AT CRYOGENIC TEMPERATURES  
DENABURG, C. R. REECE, O. Y. MAY 1965  
M-FS-257

Cryostat with support structure for test specimen allows flexure fatigue testing of honeycomb composite sandwich structures at cryogenic temperatures. The cryostat consists of a cryogen container enclosing two pairs of yokes which support two rotating end clamps.

**B65-10132**  
SIMPLE CIRCUIT POSITIONS FILM FRAMES IN PROJECTOR  
SILVER, R. H. MAY 1965  
JPL-508

Individual frames on a photographic film strip in a projector are automatically positioned by a simple circuit. The circuit uses a photodiode that senses frame registry position and a relay that stops the film-advance motor to suspend the film at point of registry.

**B65-10133**  
PROBE MEASURES CHARACTERISTICS OF HOT GAS STREAM  
INNOVATOR NOT GIVEN /PLASHADYNE CORP./ MAY 1965  
M-FS-240

Shielded, tubular flow calorimeter operated by valve position measures characteristics of a hot gas stream of unknown composition. Measurements of mass flow density and total heat content per unit mass, total heat content per unit mass only, and pitot pressure are made.

**B65-10157**  
INTERNAL COOLING INCREASES RANGE OF IMMERSION-TYPE TEMPERATURE PROBE  
LANZO, C. D. JUN. 1965  
LEWIS-171

Temperature probe used in a high temperature, high velocity gas stream consists of cooled outer shell and a cooled platinum sensing tube with iron constantan thermocouples.

**B65-10171**  
FRESNEL ZONE PLATE FORMS IMAGES AT WAVELENGTHS BELOW 1000 ANGSTROMS  
INNOVATOR NOT GIVEN /SMITHSONIAN INST./ JUN. 1965  
GSFC-231

Fresnel zone plate with openings replacing the usual transparent rings produces images in a vacuum ultraviolet. The plate is made by etching and electrodeposition.

02 ENERGY SOURCES

B65-10186  
ELECTRONIC MODULES EASILY SEPARATED FROM HEAT  
SINK  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
JUN. 1965 SEE ALSO B63-10033  
MSC-142

Metal heat sink and electronic modules bonded to a thermal bridge can be easily cleaved for removal of the modules for replacement or repair. A thin film of grease between a fluorocarbon polymer film on the metal heat sink and an adhesive film on the modules acts as the cleavage plane.

B65-10188  
REFRACTORY METAL SHIELDING /INSULATION/  
INCREASES OPERATING RANGE OF INDUCTION FURNACE  
EBIHARA, B. T. JUN. 1965  
LEWIS-202

Thermal radiation shield contains escaping heat from an induction furnace. The shield consists of a sheet of refractory metal foil and a loosely packed mat of refractory metal fibers in a concentric pattern. This shielding technique can be used for high temperature ovens, high temperature fluid lines, and chemical reaction vessels.

B65-10211  
LIGHT RAY MODULATION CONTROLS OPTICAL SYSTEM  
ALIGNMENT  
INNOVATOR NOT GIVEN /KOLLSMAN INSTR. CORP./ JUL.  
1965  
GSFC-171

Light ray modulator maintains focus in optical system subject to severe thermal gradients, vibration and shock. The modulated signals drive a servo system that aligns the system optics.

B65-10224  
HEATER DECOMPOSES OIL BACKSTREAMING FROM  
HIGH-VACUUM PUMPS  
SHAPIRO, H. AUG. 1965  
GSFC-356

Heater placed between an oil diffusion pump and a vacuum chamber prevents backstreaming of oil molecules into the work area of the chamber. It breaks the oil molecules into basic constituents that can be pumped away.

B65-10239  
ION PUMP PROVIDES INCREASED VACUUM PUMPING  
SPEED  
INNOVATOR NOT GIVEN /GEOPHYS. CORP. OF AM./ AUG.  
1965  
NEO-13

Multiple-cell ion pumps with increased vacuum pumping speed are used for producing ultrahigh vacuums in vacuum tubes and mass spectrometers. The pump has eight cathode-anode magnetron cells arranged in a cylinder which increase the surface area of the cathode.

B65-10240  
INSULATION ACCELERATES RATE OF COOLING WITH  
CRYOGENIC FLUID  
ALLEN, L. D. AUG. 1965  
MSC-161

Thermal insulating material increases the rate of heat transfer from the interior of a chamber to a liquid nitrogen-filled metal jacket. A thin film of the material is bonded to the surface of the metal wall facing the liquid nitrogen.

B65-10252  
DISTANT OBJECTS DETECTED VISUALLY WITH  
OPTICAL FILTERS  
INNOVATOR NOT GIVEN AUG. 1965  
LANGLEY-166

Fluorescent coating aids visual daylight detection and identification of distant objects. An object appears as a blinking light when the area is alternately scanned with transmitting and obscuring filters. This method can be effective in search and rescue operations.

B65-10253  
OIL-DAMPED MERCURY POOL MAKES PRECISE  
OPTICAL ALIGNMENT TOOL  
THEKAEKARA, M. P. AUG. 1965

GSFC-353

Mercury pool with a cover layer of high viscosity oil provides a reference reflector for precise alignment of optical instruments. The cover layer effectively damps any ripples in the mercury from support structure vibrations.

B65-10272  
INFRARED SHIELD FACILITATES OPTICAL PYROMETER  
MEASUREMENTS  
EICHENBRENNER, F. F. ILLG, W. SEP. 1965  
LANGLEY-133

Water-cooled shield facilitates optical pyrometer high temperature measurements of small sheet metal specimens subjected to tensile stress in fatigue tests. The shield excludes direct or reflected radiation from one face of the specimen and permits viewing of the infrared radiation only.

B65-10280  
ELECTRON BOMBARDMENT IMPROVES VACUUM CHAMBER  
EFFICIENCY  
PRZYBYSZEWSKI, J. SWIKER, M. A. WATSON, J. SEP.  
1965  
LEWIS-160

Bombardment of vacuum chamber walls by an electron gun within the chamber achieves greater efficiency with less cost. The ultimate vacuum reached using the gun is greater than the system design level.

B65-10283  
ELECTRON-BEAM DEFLECTION CONTROLLED BY DIGITAL  
SIGNALS  
CRESSEY, J. R. SEP. 1965  
GSFC-385

Electron-beam deflection in electronic image converters is controlled by a tapped magnetic deflection yoke and a series of current generators. The generators supply equal current to each tap through digitally controlled switches, thereby increasing the inherent accuracy of the system.

B65-10291  
SPIRALED CHANNELS IMPROVE HEAT TRANSFER BETWEEN  
FLUIDS  
HIGA, W. WIEBE, E. R. OCT. 1965  
JPL-694

Spiral flow channels increase heat transfer between two fluids in a countercurrent heat exchanger of given volume. The heat exchanger is constructed by connecting a spiraled bellows-shaped ducting between two concentric cylindrical tubes.

B65-10292  
INTERFEROMETER CONSTRUCTION ASSURES  
PARALLELISM OF CRITICAL COMPONENTS  
CONNES, P. OCT. 1965  
JPL-704

Interferometer with rigidly mounted components assures parallelism of critical components. The interferometer is constructed for effective operation even if the total instrument is subjected to mechanical stress.

B65-10295  
UNIQUE CONSTRUCTION MAKES INTERFEROMETER  
INSENSITIVE TO MECHANICAL STRESSES  
BEER, R. OCT. 1965  
JPL-725

Michelson-type interferometer with a cat-eye reflector operates effectively even in the presence of random mechanical stresses. A cubical beamsplitter with dichroic surfaces permits operation in infrared or visible light.

B65-10296  
COAXIAL CAPACITOR USED TO DETERMINE FLUID  
DENSITY  
ATKISSON, E. A. OCT. 1965  
LEWIS-232

Sensing device measures directly the density of compressible fluid existing simultaneously in both liquid and gaseous phases. The device is comprised of a capacitor connected as one leg of a bridge circuit, a power source, and an indicator calibrated to indicate density as a direct

measurement.

B65-10297

**SUPERCONDUCTOR SHIELDS TEST CHAMBER FROM AMBIENT MAGNETIC FIELDS**  
HILDEBRANDT, A. F. OCT. 1965  
JPL-627

Shielding a test chamber for magnetic components enables it to maintain a constant, low magnetic field. The chamber is shielded from ambient magnetic fields by a lead foil cylinder maintained in a superconducting state by liquid helium.

B65-10330

**WEDGE IMMersed THERMISTOR BOLOMETER MEASURES INFRARED RADIATION**  
DREYFUS, M. G. /BARNES ENG. CO/. NOV. 1965  
GSFC-443

Wedge immersed-thermistor bolometer measures infrared radiation in the atmosphere. The thermistor flakes are immersed by optical contact on a wedge-shaped germanium lens whose narrow dimension is clamped between two complementary wedge-shaped germanium blocks bonded with a suitable adhesive.

B65-10331

**CLOSED FLUID SYSTEM WITHOUT MOVING PARTS CONTROLS TEMPERATURE**  
STENGER, F. J. NOV. 1965  
LEWIS-222

Closed fluid system maintains a constant temperature in an insulated region without the use of any moving parts. Within the system, the energy for thermodynamic cycling of two-phase heat transfer fluid and a hydraulic fluid is entirely supplied by the heat generated in the thermally insulated region.

B65-10356

**SEGMENTED ELECTRODE INCREASES OPERATING PRESSURE OF MHD ACCELERATOR**  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
NOV. 1965  
LANGLEY-95

Circumferentially segmented-ring electrode replaces the solid-ring electrode in a basic magnetohydrodynamic /MHD/ accelerator. This produces diffuse discharges at pressures as high as 100 atmospheres.

B65-10368

**VACUUM CHAMBER PROVIDES IMPROVED INSULATION AND SUPPORT FOR CRYOSTAT**  
INNOVATOR NOT GIVEN /GE/ DEC. 1965  
M-FS-415

Taut wires in an evacuated cylinder minimize heat transfer through the walls and junctions of a liquid-helium-filled cryostat by suspending the cryostat.

B65-10373

**MODIFIED PROCEDURE SPEEDS CAMERA COPY LAYOUT FOR OFFSET PRINTING**  
SMITH, L. F. DEC. 1965  
GSFC-424

Projecting a grid pattern on a steel layout board facilitates the alignment of camera copy for photo-offset reproduction. Small flat bar magnets fasten the copy to the board.

B65-10395

**OPTICAL OUTPUT ENHANCES FLOWMETER ACCURACY**  
WOLPIN, E. G. /N. AM. AVIATION/ DEC. 1965  
M-FS-482

Magnetic flowmeter with a direct-coupled optical output increases accuracy and operates independently of other system inputs. The design includes simple external adjustment and signal amplitude control.

DIMEFF, J. NEEL, C. B. APR. 1964  
ARC-3

To replace the classical hollow sphere, a compact reference black body has been constructed from stacked razor blades. Treated with a deposit of black oxide on the surfaces or notches between the upper edges of the blades, the device is useful over a wide range of incident angles.

B63-10207

**THERMALLY CONDUCTIVE METAL WOOL-SILICONE RUBBER MATERIAL CAN BE USED AS SHOCK AND VIBRATION DAMPER**  
HOUGH, W. W. APR. 1964  
JPL-321

Bronze wool pads, impregnated with silicon rubber, meet the requirement for a thermally conductive, shock and vibration absorbing material. They serve as spacers in equipment mounting and are resistant to high temperatures.

B63-10234

**FILTER FOR HIGH-PRESSURE GASES HAS EASY TAKE-DOWN, ASSEMBLY**  
MAC GLASHAN, W. F. FEB. 1964  
JPL-373

A small metal filter body, for use in tubing supplying sterilization gases, has an inlet end that can be unscrewed. Inside, the high pressure filter is supported on both sides and sealed by an O-ring. Design facilitates easy assembly and disassembly of parts.

B63-10235

**CRYOGENIC FILTER METHOD PRODUCES SUPER-PURE HELIUM AND HELIUM ISOTOPES**  
HILDEBRANDT, A. F. MAR. 1964  
JPL-374

To purify helium, it is cooled in a low pressure environment until it becomes superfluid. The liquid helium is then filtered through iron oxide particles. Heating, cooling and filtering processes continue until the purified liquid helium is heated to a gas.

B63-10263

**FRESNEL CUP REFLECTOR DIRECTS MAXIMUM ENERGY FROM LIGHT SOURCE**  
LAUE, E. G. YOUNGBERG, C. L. MAY 1964  
JPL-424

To minimize shielding and overheating, a composite Fresnel cup reflector design directs the maximum energy from a light source. It consists of a uniformly ellipsoidal end surface and an extension comprising a series of confocal ellipsoidal and concentric spherical surfaces.

B63-10311

**OIL-SMEARED MODELS AID WIND TUNNEL MEASUREMENTS**  
KATZOFF, S. LOVING, D. K. 1 APR. 1964 /SEE NASA-MEMO-3-17-59L/  
LANGLEY-4

For visualizing flow characteristics in wind tunnel tests, model surfaces are smeared with any common petroleum-base oils. These fluoresce under ultraviolet light and the flow patterns are readily visualized.

B63-10318

**QUICK-HARDENING PROBLEMS ARE ELIMINATED WITH SPRAY GUN MODIFICATION WHICH MIXES RESIN AND ACCELERATOR LIQUIDS DURING APPLICATION**  
JOHNSON, O. W. MAR. 1964 /SEE U.S. PATENT NO. 2,930,532/  
LANGLEY-6A

A modified spray gun, with separate containers for resin and additive components, solves the problems of quick hardening and nozzle clogging. At application, separate atomizers spray the liquids in front of the nozzle face where they blend.

B63-10337

**GALLIUM USEFUL BEARING LUBRICANT IN HIGH-VACUUM ENVIRONMENT**  
BUCKLEY, D. H. MAY 1964 /SEE U.S. PATENT NO. 3,072,574/  
LEWIS-12

Solid gallium is used as a lubricant on bearings

## 03 MATERIALS (CHEMISTRY)

B63-10004

**REFERENCE BLACK BODY IS COMPACT, CONVENIENT TO USE**

03 MATERIALS (CHEMISTRY)

made of compatible materials. Such lubricants perform well in a high vacuum and under low temperature.

**B63-10345**  
**APPARATUS FACILITATES HIGH-TEMPERATURE TENSILE TESTING IN VACUUM**  
 SIKORA, P. F. JUN. 1964  
 LEWIS-42

An apparatus for heating refractory materials to high temperatures during tensile testing includes a water-cooled stainless steel vacuum chamber. This contains a resistance heater consisting of a slit tube of tantalum or tungsten to enclose the tensile test rod.

**B63-10351**  
**NEW COBALT ALLOYS HAVE HIGH-TEMPERATURE STRENGTH AND LONG LIFE IN VACUUM ENVIRONMENTS**  
 ASHBROOK, R. L. FRECHE, J. C. KLIMA, S. J. MAR. 1964  
 LEWIS-47

Cobalt refractory metal alloys combine sheet formability with high temperature strength and low material loss in vacuum.

**B63-10365**  
**LOW-COST INSULATION SYSTEM FOR CRYOSTATS ELIMINATES NEED FOR A VACUUM**  
 CALVERT, H. F. MAY 1964  
 LEWIS-64

In order to eliminate the hazard caused by residual air trapped between the concentric shells of a cryostat, these annular spaces are pressurized with helium gas. This system is more economical than the use of powdered insulation maintained at low vacuums.

**B63-10378**  
**LIQUID-LEVEL METER HAS NO MOVING PARTS**  
 ESCUE, W. T. /BENDIX CORP./ JUN. 1964  
 M-FS-3

An electro-optical system, without moving parts, reliably indicates liquid levels at cryogenic temperatures. Glass prisms, which act as liquid level probes inside the tank, extend from optically aligned photoelectric assemblies mounted on the outside.

**B63-10389**  
**LIGHTWEIGHT MAGNESIUM-LITHIUM ALLOYS SHOW PROMISE**  
 ADAMS, W. T. CATALDO, C. E. JUN. 1964  
 M-FS-17

Evaluation tests show that magnesium-lithium alloys are lighter and more ductile than other magnesium alloys. They are being used for packaging, housings, containers, etc., where light weight is more important than strength.

**B63-10424**  
**VARIABLE LIGHT SOURCE WITH A MILLION-TO-ONE INTENSITY RATIO**  
 SNOW, W. B. /SPACE TECHNOL. LAB./ MAY 1964  
 JPL-WOO-008

A wide range, variable intensity light source of constant color characteristics has been developed for testing and calibrating photomultiplier tubes. A light attenuator first diffuses light from a constant source, then permits variable attenuation through a series of chambers and adjustable apertures.

**B63-10429**  
**WELDED PRESSURE TRANSDUCER MADE AS SMALL AS 1/8TH-INCH IN DIAMETER**  
 COON, G. W. MAR. 1964 /SEE U.S. PATENT NO. 3,027,769/  
 ARC-11

A special spot welding technique is used to make miniature capacitance transducers for placing in a wind tunnel model. Rugged and relatively low in cost, they have a flat response up to one-third of the resonant frequency.

**B63-10453**  
**MOLYBDENUM DISULFIDE MIXTURES MAKE EFFECTIVE HIGH-VACUUM LUBRICANTS**  
 INNOVATOR NOT GIVEN /MIDWEST RES. INST./ NOV.

1964  
 M-FS-54

Five different mixtures of molybdenum disulfide are found to be effective bearing lubricants when tested at very low pressures and high temperatures.

**B63-10476**  
**CESIUM IODIDE CRYSTALS FUSED TO VACUUM TUBE FACEPLATES**  
 FLECK, H. G. /ELECTRO-MECHANICAL RES. INC./ MAY 1964  
 GSFC-67

A cesium iodide crystal is fused to the lithium fluoride faceplate of a photon scintillator image tube. The conventional silver chloride solder is then used to attach the faceplate to the metal support.

**B63-10479**  
**IMPROVED MOLYBDENUM DISULFIDE-SILVER MOTOR BRUSHES HAVE EXTENDED LIFE**  
 HORTON, J. C. KING, H. M. MAY 1964  
 M-FS-64

Motor brushes of proper quantities of molybdenum disulfide and copper or silver are manufactured by sintering techniques. Graphite molds are used. These brushes operate satisfactorily for long periods in normal atmosphere or in a high-vacuum environment.

**B63-10481**  
**REFRACTORY CERAMIC HAS WIDE USAGE, LOW FABRICATION COST**  
 INNOVATOR NOT GIVEN /GEORGIA INST. OF TECH./ APR. 1964  
 M-FS-67

Particulate, fused amorphous silica is formed into complex shapes by casting in plaster molds. High temperature firing is not required. This ceramic is resistant to thermal shock and exhibits good strength properties.

**B63-10528**  
**VARIABLE-TRANSPARENCY WALL REGULATES TEMPERATURES OF STRUCTURES**  
 OSULLIVAN, W. J. JUN. 1964  
 LANGLEY-25

An effective temperature regulating wall consists of one layer /e.g., one of the paraffins/ relatively opaque to thermal radiation in the solid state and transparent to it in the molten state and placed between two transparent layers. A mirror coating is applied to back layer.

**B63-10546**  
**TEST DEVICE PREVENTS MOLECULAR BOUNCE-BACK**  
 HARDGROVE, W. F. SHAPIRO, H. JULY 1964  
 GSFC-82

A test device, which consists of six pyramidal reflectors joined together, acts as a baffle to impede the free path of the molecule to the test item by interposing a slanted surface which imparts an angular vector to the molecule and bounces it back to the chamber wall.

**B63-10557**  
**RAPID HELIUM-AIR ANALYZER CAN MEASURE OTHER BINARY GAS MIXTURES**  
 MELFI, L. T. WOOD, G. M. YEAGER, P. R. FEB. 1964  
 LANGLEY-16

An instrument comprised of an ionization pressure gauge + a diaphragm pressure gauge consisting of strain gauges to make a four-arm bridge, and a ratio meter is constructed for analyzing gas mixtures. The ratio of the outputs of the two gauges is proportional to the mixture composition.

**B63-10562**  
**GATE VALVE WITH CERAMIC-COATED BASE OPERATES AT HIGH TEMPERATURES**  
 BRASS, A. JUL. 1964  
 ARC-23

A copper base insert coated with a layer of aluminum oxide ceramic prevents frictional binding between the gate and base surfaces of a gate valve which are subject to rapid sliding action and high temperatures.

B63-10612

METALS PLATED ON FLUOROCARBON POLYMERS  
 FORD, H. KRASINSKY, J. B. VANGO, S. P. OCT.  
 1964

JPL-544

Electroplating lead on fluorocarbon polymer parts is accomplished by etching the parts to be plated with sodium, followed by successive depositions of silver and lead from ultrasonically agitated plating solutions. Metals other than lead may be electroplated on the silvered parts.

B64-10068

MECHANICAL PROPERTIES OF PLASTICS PREDETERMINED BY EMPIRICAL METHOD

LOHR, J. J. PARKER, J. A. JUL. 1964  
 ARC-28

To predetermine the mechanical properties of rigid plastics as a function of plasticizer content and composition, a set of equations has been empirically derived. These relate strain rate, yield stress, temperature, and weight fraction of the plasticizer.

B64-10099

REFRACTORY THERMAL INSULATION FOR SMOOTH METAL SURFACES

INNOVATOR NOT GIVEN /GOODYEAR AEROSPACE CORP./  
 OCT. 1964

M-FS-160

To protect rocket metal surfaces from engine-exhaust heat, a refractory thermal insulation mixture, which adheres to smooth metals, has been developed. Insulation protection over a wide temperature range can be controlled by thickness of the applied mixture.

B64-10113

ELASTOMERS BONDED TO METAL SURFACES SEAL ELECTROCHEMICAL CELLS

SHERFEY, J. M. AUG. 1964

GSFC-168

A leakproof seal secondary cell containing alkaline electrolytes was developed by bonding an alkali-resistant elastomer, such as neoprene, to metal contact surfaces. Test results of several different elastomers strongly indicate the feasibility of this sealing method.

B64-10116

LEAD OXIDE CERAMIC MAKES EXCELLENT HIGH-TEMPERATURE LUBRICANT

JOHNSON, R. L. SLINEY, H. E. AUG. 1964  
 LEWIS-144

A dry lubricant coating in ceramic form consisting of 95 percent lead monoxide and 5 percent silicon dioxide withstood a temperature of 1200 deg F, with a bearing operating at various atmospheric pressures. From this testing, there was no galling or metal transfer of the bearing.

B64-10138

NOVEL SHOCK ABSORBER FEATURES VARYING YIELD STRENGTHS

GEIER, D. J. JUL. 1964

MSC-63A

A shock absorbent webbing of partially drawn synthetic strands is arranged in sections of varying density related to the varying mass of the human body. This is contoured to protect the body at points of contact, when subjected to large acceleration or deceleration forces.

B64-10142

STRINGENT CLEANING TECHNIQUE ASSURES RELIABLE EPOXY BOND

INNOVATOR NOT GIVEN /RCA/ JUN. 1964

GSFC-161

For reliable aluminum bonding to withstand stress, the mating surfaces are carefully cleaned, etched, rinsed and dried. An epoxy and hardener designed for metal-to-metal bonding is then used for a rigid assembly.

B64-10151

PLASTIC FILMS FOR REFLECTIVE SURFACES

REPRODUCED FROM MASTERS

INNOVATOR NOT GIVEN /MINNEAPOLIS HONEYWELL/ OCT.  
 1964

GSFC-188

Accurate reproduction in plastic of the surface of the optical master to which a reflective finish may be applied is done by using backing from any suitable material to which cured plastic will adhere tightly. Plastics used for reflectors should be of the thermosetting or catalytically hardened type.

B64-10166

FILLER DEVICE FOR HANDLING HOT CORROSIVE

MATERIALS

INNOVATOR NOT GIVEN /PRATT AND WHITNEY AIRCRAFT/  
 OCT. 1964

MSC-85

A bellows-type bag with its own heating element is developed for safe handling and injection of hot corrosive liquids into modules.

B64-10206

SOLDER FLUX LEAVES CORROSION-RESISTANT

COATING ON METAL

BAUMAN, A. J. OCT. 1964

JPL-611

A soldering flux consisting of perfluoro-octanoic acid hydrazine provides a corrosion resistant film on metal surface, particularly copper. It is ineffective for soldering aluminum.

B64-10270

PRESSURE MOLDING OF POWDERED MATERIALS

IMPROVED BY RUBBER MOLD INSERT

INNOVATOR NOT GIVEN /ELECTRO-OPTICAL SYSTEMS  
 CORP./ NOV. 1964

WOO-100

Pressure molding tungsten microspheres is accomplished by applying hydraulic pressure to a silicone rubber mold insert with several barrel shaped chambers which is placed in a steel die cavity. This technique eliminates castings containing shear fractures.

B64-10282

FINE-MESH SCREEN MADE BY SIMPLIFIED METHOD

INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ DEC.  
 1964

WOO-104

Strong fine-mesh screens are fabricated by a method involving uniform distribution of fine ferromagnetic particles on a nonmagnetic plate. Such screens are commonly used for grids in electron tubes and ion devices.

B64-10319

GAS DIFFUSION CELL REMOVES CARBON DIOXIDE FROM OCCUPIED AIRTIGHT ENCLOSURES

INNOVATOR NOT GIVEN /IOWA U./ DEC. 1964  
 MSC-118

A small, lightweight permeable cell package separates and removes carbon dioxide from respiratory regenerative while chemically inert in the presence of carbon dioxide so that only adsorption takes place.

B65-10004

SCREENING TECHNIQUE MAKES RELIABLE BOND AT ROOM TEMPERATURE

INNOVATOR NOT GIVEN /IBM/ JAN. 1965

M-FS-227

Stainless-steel screen used to lay room temperature curing epoxy adhesive permits reliable bonding of electronic circuits boards. This technique would be useful with thin-walled structures that warp during conventional bonding operations.

B65-10015

IMPROVED CONDUCTIVE PASTE SECURES BIOMEDICAL ELECTRODES

INNOVATOR NOT GIVEN /BAYLOR UNIV./ JAN. 1965 SEE  
 ALSO B64-10025

MSC-107

Nontoxic paste consisting of a dispersion of graphite or silver granules in a mixture of

03 MATERIALS (CHEMISTRY)

polyvinylpyrrolidone and diluted glycerol secures biomedical electrodes to human skin. Silver paste has a high electrical conductivity and forms a bond between metal and moist or dry skin.

**B65-10016**  
**ADHESIVE FOR VACUUM ENVIRONMENTS RESISTS SHOCK AND VIBRATION**  
 INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./  
 FEB. 1965  
 MSC-56

A mixture of a polyamide, an epoxy resin, and fine silica or glass microballoons provides an adhesive which is flexible, resistant to shock and vibration, and has improved heat-transfer characteristics.

**B65-10024**  
**FLUID PRESSURE USED TO TEST TURBOPUMP BEARINGS**  
 INNOVATOR NOT GIVEN /AEROJET-GEN. CORP./ FEB. 1965  
 NU-0001

Testing of turbopump bearings operating in an intense radiation field is accomplished by the use of a fluid bearing tester providing radial and axial loading.

**B65-10032**  
**WIRE WINDING INCREASES LIFETIME OF OXIDE-COATED CATHODES**  
 KERSLAKE, W. VARGO, D. FEB. 1965 SEE ALSO AIAA PAPER-64-683  
 LEWIS-154

Refractory-metal heater base wound with a thin refractory metal wire increases the longevity of oxide-coated cathodes. The wire-wound unit is impregnated with the required thickness of metal oxide. This cathode is useful in magneto-hydrodynamic systems and in electron tubes.

**B65-10034**  
**GAGE MEASURES ELECTRICAL CONNECTOR PIN RETENTION FORCE**  
 INNOVATOR NOT GIVEN /RCA/ FEB. 1965  
 JPL-SC-071

The retention force of a female connector pin is measured by observing the action of a calibrated spring in a gauge consisting of housing, a plunger terminating in a male subminiature connector pin and the tension spring.

**B65-10043**  
**MOUTHPIECE ADAPTER FOR PIPETTES PROTECTS MOUTH FROM HARMFUL LIQUIDS**  
 MC SMITH, D. G. FEB. 1965  
 LANGLEY-47

To prevent the laboratory technicians mouth from contacting harmful liquids, a device with a hermetically sealed elastic bellows is attached to a standard pipette.

**B65-10044**  
**FLEXIBLE CURTAIN SHIELDS EQUIPMENT FROM INTENSE HEAT FLUXES**  
 INNOVATOR NOT GIVEN /ARROWHEAD PROD./ MAR. 1965  
 M-FS-48

Flexible, high strength curtain made of fiberglass-silicone elastomer laminate provides thermal shielding for equipment.

**B65-10065**  
**SPHERICAL MODEL PROVIDES VISUAL AID FOR CUBIC CRYSTAL STUDY**  
 BACIGALUPI, R. J. SPAKOWSKI, A. E. MAR. 1965  
 LEWIS-108

Transparent sphere of polymethylmethacrylate with major zones and poles of cubic crystals is used to make crystallographic visualizations and to interpret Laue X-ray diffraction of single cubic crystals.

**B65-10083**  
**DIDYMIUM COMPOUND IMPROVES NICKEL-CADMIUM CELL**  
 INNOVATOR NOT GIVEN /GE/ MAR. 1965  
 GSFC-295

Nickel electrodes impregnated with an additive solution of didymium hydrate and nitric acid mixed with nickel nitrate increases ampere-hour capacity

of cells and does not affect the voltage characteristics.

**B65-10088**  
**FIBERGLASS PARTS CURED DURING FILAMENT WINDING ELIMINATES OVEN, SAVES TIME**  
 CARMODY, R. J. APR. 1965  
 M-FS-14

Resistance wire layer is introduced during winding of the fiberglass filaments with simultaneous heating. Emission of heat from the wire layer cures second fiberglass layer.

**B65-10092**  
**LIGHTWEIGHT ALUMINUM CASTING ALLOY IS USEFUL AT CRYOGENIC TEMPERATURES**  
 INNOVATOR NOT GIVEN APR. 1965  
 M-FS-267

M-45, a lightweight, high purity aluminum casting alloy has superior tensile properties for use at cryogenic temperatures.

**B65-10095**  
**CARBON-ARC ROD HOLDER HAS LONG LIFE, REDUCES ARC SPLATTER**  
 INNOVATOR NOT GIVEN /RCA/ APR. 1965 1965  
 MSC-144

Carbon-arc rod holder with front end of beryllium oxide, a high electrical resistor and good thermal conductor, prevents nonuniform burning of the positive carbon rod and corrosion of the rod holder. Useful in optical instrument light sources.

**B65-10106**  
**MINIATURE BEARINGS LUBRICATED BY SONIC DISPERSION METHOD**  
 INNOVATOR NOT GIVEN /LITTON IND./ APR. 1965  
 M-FS-202

Evenly distributing a monomolecular film over the balls and tracks of miniature precision ball bearings by sonic dispersion results in precise lubrication which prevents lubricant bleed out to adjacent components. Varying the lubricant-to-solvent ratio of the mixture causes varying lubricant coating thicknesses.

**B65-10107**  
**CRACK DETECTION METHOD IS SAFE IN PRESENCE OF LIQUID OXYGEN**  
 INNOVATOR NOT GIVEN /BOEING CO./ APR. 1965  
 M-FS-236

Visual flaw detection method for metals utilizes color precipitate. This method can be used safely in the presence of liquid oxygen.

**B65-10117**  
**DOUBLE GLOVES REDUCE CONTAMINATION OF DRY BOX ATMOSPHERE**  
 HERBELL, T. P. QUANTINETZ, M. REINHARDT, G. APR. 1965  
 LEWIS-211

Pair of encased low permeability hand gloves between which an inert gas circulates reduces dry box contamination. This innovation is applicable to dry boxes using radioactive and alkali metal compounds, submicron powders, and liquid metals.

**B65-10136**  
**VAPOR PRESSURE MEASURED WITH INFLATABLE PLASTIC BAG**  
 INNOVATOR NOT GIVEN /GEOPHYS. CORP. OF AM./ MAY 1965  
 GSFC-281

Deflated plastic bag in a vacuum chamber measures initial low vapor pressures of materials. The bag captures the test sample vapors and visual observation of the vapor-inflated bag under increasing external pressures yields pertinent data.

**B65-10140**  
**GALVANIC CORROSION REDUCED IN ALUMINUM FABRICATIONS**  
 INNOVATOR NOT GIVEN MAY 1965  
 M-FS-272

Titanium alloy fasteners dipped in zinc chromate primer are installed while wet in protective coated aluminum panels to reduce galvanic

corrosion. Moisture-tight seals at fastener points are also provided.

**B65-10156**  
**INORGANIC PAINT IS DURABLE, FIREPROOF, EASY TO APPLY**  
 SCHUTT, J. B. JUN. 1965  
 GSFC-366

Inorganic paint with a water-potassium silicate base is impervious to water. It is also fireproof and adheres to various surfaces exposed to wide temperature fluctuations

**B65-10162**  
**ELECTROLESS NICKEL RESIST USED IN ALKALI-ETCHING OF ALUMINUM**  
 INNOVATOR NOT GIVEN /G. T. SCHJELDAHL CO./ JUN. 1965  
 GSFC-284

Electroless nickel resist is unaffected by caustic soda applied as a milling or etching agent on aluminum.

**B65-10164**  
**IRRADIATION IMPROVES PROPERTIES OF AN AROMATIC POLYESTER**  
 BELL, V. L., JR. JUN. 1965  
 LANGLEY-115

Aromatic polyester, PEN-2,6, is improved through cross-linking effected by radiation. Polymer retains properties of high tensile strength and toughness and stability at high temperatures.

**B65-10167**  
**REFRACTORY OXIDES EVALUATED FOR HIGH-TEMPERATURE USE**  
 INNOVATOR NOT GIVEN JUN. 1965  
 LANGLEY-121

Partially calcia-stabilized zirconia used for insulation and heat-storage in high temperature /3000 deg to 4000 deg F/ cyclically operated pebble bed air heater.

**B65-10172**  
**ALUMINUM ALLOYS PROTECTED AGAINST STRESS-CORROSION CRACKING**  
 INNOVATOR NOT GIVEN /ALCOA RES. LABS./ JUN. 1965  
 M-FS-235

Topcoat of epoxy-polyamide paint is effective protection for aluminum alloys against stress corrosion cracking. The paint can be used on unprimed surfaces.

**B65-10173**  
**PEEL RESISTANCE OF ADHESIVE BONDS ACCURATELY MEASURED**  
 INNOVATOR NOT GIVEN /RCA/ JUN. 1965 1965  
 GSFC-320

Strength of adhesive bond between layers of laminated material is tested by peel force to the facing with a tensile testing machine. Testing jig has stainless steel rollers which constrain material to move horizontally while maintaining free end of facing at constant 90 deg angle.

**B65-10175**  
**TANTALUM CATHODE IMPROVES ELECTRON-BEAM EVAPORATION OF TANTALUM**  
 INNOVATOR NOT GIVEN /ELECTRO-OPTICAL SYSTEMS/ JUN. 1965  
 JPL-W00-021

Tantalum cathode is used in assembly for electron beam evaporation of tantalum onto a substrate. The cathode and anode are made of pure tantalum rather than tungsten to prevent contamination of the tantalum film deposited on the substrate.

**B65-10179**  
**REUSABLE NEOPRENE JACKET PROTECTS PARTS FOR CHEMICAL MILLING**  
 INNOVATOR NOT GIVEN /RYAN AERONAUTICAL CO./ JUN. 1965  
 W00-071

Reusable neoprene jacket is used to prepare metal part or panel for chemical milling. Jacket covers back and upper rim of part and is sealed before the masking solution is applied to surface to be milled. This reduces amount of masking material required for milling identical parts and increases

production.

**B65-10189**  
**TESTING DEVICE SUBJECTS ELASTIC MATERIALS TO BIAXIAL DEFORMATIONS**  
 BECKER, G. W. JUN. 1965  
 JPL-616

Testing device stretches elastic materials biaxially over large deformation ranges and varies strain ratios in two perpendicular directions. The device is used in conjunction with a tensile testing machine, which holds the specimen and permits control over the direction and magnitude of the stresses applied.

**B65-10190**  
**IR-TRANSMISSION GLASSES FORMED FROM OXIDES OF BISMUTH AND TELLURIUM**  
 ULRICH, D. R. JUN. 1965  
 M-FS-279

Bismuth trioxide-tellurium dioxide glasses have improved infrared transmission characteristics.

**B65-10214**  
**EMERGENCY SOLAR STILL DESALTS SEAWATER**  
 INNOVATOR NOT GIVEN /MELPAR/ JUL. 1965  
 MSC-135

Solar energy apparatus distills seawater into fresh water. The inflatable buoyant still produces two pints of drinking water a day.

**B65-10217**  
**THIN TRANSPARENT FILMS FORMED FROM POWDERED GLASS**  
 INNOVATOR NOT GIVEN /HOFFMAN ELECTRON./ JUL. 1965  
 GSFC-352

Glass film less than five mils thick is formed from powdered glass dispersed in an organic liquid, deposited on a substrate, and fused into place. The thin films can be cut and shaped for contact lenses, optical filters and insulating layers.

**B65-10220**  
**THORIATED NICKEL BONDED BY SOLID-STATE DIFFUSION METHOD**  
 BALES, T. T. MANNING, R. C., JR. AUG. 1965  
 LANGLEY-116

Solid-state diffusion bonding in an inert-gas atmosphere forms high-strength joints between butting or overlapping surfaces of thoriated nickel. This method eliminates inert-phase agglomeration.

**B65-10250**  
**COATING METHOD ENABLES LOW-TEMPERATURE BRAZING OF STAINLESS STEEL**  
 SEAMAN, F. D. /WESTINGHOUSE ELEC. CO./ AUG. 1965  
 NU-0030

Gold coated stainless steel tubes containing insulated electrical conductors are brazed at a low temperature to a copper coated stainless steel sealing block with a gold-copper eutectic. This produces an effective seal without using flux or damaging the electrical conductors.

**B65-10261**  
**BORON CARBIDE WHISKERS PRODUCED BY VAPOR DEPOSITION**  
 INNOVATOR NOT GIVEN /GE/ SEP. 1965  
 HQ-24

Boron carbide whiskers have an excellent combination of properties for use as a reinforcement material. They are produced by vaporizing boron carbide powder and condensing the vapors on a substrate. Certain catalysts promote the growth rate and size of the whiskers.

**B65-10270**  
**CERAMIC MATERIALS PURIFIED BY EXPERIMENTAL METHOD**  
 INNOVATOR NOT GIVEN /IIT RES. INST./ SEP. 1965  
 LEWIS-225

Crystalline ceramic materials are purified for use as high-temperature electrical insulators. Any impurities migrate to the cathode when a dc voltage is applied across the material while it is heated in an inert gas atmosphere.

03 MATERIALS (CHEMISTRY)

B65-10288

ORGANIC REACTANTS RAPIDLY PRODUCE PLASTIC FOAM  
LOOK, G. F. SEP. 1965 SEE ALSO B65-10090  
LANGLEY-37

Adding trichlorofluoromethane to polyether resin accelerates the reaction between the resin and toluene diisocyanate. This accelerated reaction instantaneously produces a plastic foam of low density and uniform porosity needed to provide buoyancy for flotation recovery of instrument packages dropped into the sea from spacecraft.

B65-10294

ADHERENT PROTECTIVE COATINGS PLATED ON  
MAGNESIUM-LITHIUM ALLOY  
INNOVATOR NOT GIVEN /IBM/ OCT. 1965 SEE ALSO  
B63-10389  
M-FS-365

Zinc is plated on a magnesium-lithium alloy by using a modification of the standard zinc-plate immersion bath. Further protection is given the alloy by applying a light plating of copper on the zinc plating. Other metals are plated on the copper by using conventional plating baths.

B65-10302

BURNISHING TECHNIQUE IMPROVES LUBRICATION OF  
THREADED FASTENERS  
GRUPER, J. L. /LOCKHEED MISSILES AND SPACE CO./  
OCT. 1965  
LEWIS-217

Burnishing a polydisulfide coating into the thread surfaces of fasteners eliminates the need for binders and vehicles which ensure coverage and retention of the lubricant during fastening. The coating may be applied by any convenient method.

B65-10303

NICKEL SOLUTION PREPARED FOR PRECISION  
ELECTROFORMING  
INNOVATOR NOT GIVEN /ELECTRO-OPTICAL SYSTEMS/  
OCT. 1965  
WOO-070

Lightweight, precision optical reflectors are made by electroforming nickel onto masters. Steps for the plating bath preparation, process-control testing, and bath composition adjustments are prescribed to avoid internal stresses and maintain dimensional accuracy of the electrodeposited metal.

B65-10316

REMOVABLE WELL IN REACTION FLASK FACILITATES  
CARBON DIOXIDE COLLECTION  
NEVILLE, E. D. FELLER, D. D. OCT. 1965  
ARC-47

Removable plastic well with a flange that seats on the rim of an Erlenmeyer screwcap flask aids quantitative collection of carbon dioxide liberated in the flask. The well can be removed without danger of cross-contamination. It can collect other gases using appropriate absorbents.

B65-10321

PLATED NICKEL WIRE MESH MAKES SUPERIOR  
CATALYST BED  
SILL, H. /BELL AEROSYSTEMS CO./ OCT. 1965  
MSC-216

Porous nickel mesh screen catalyst bed produces gas evolution in hydrogen peroxide thrust chambers used for attitude control of space vehicles. The nickel wire mesh disks in the catalyst bed are plated in rugose form with a silver-gold coating.

B65-10335

MAGNETIC FLUID READILY CONTROLLED IN ZERO  
GRAVITY ENVIRONMENT  
PAPELL, S. S. NOV. 1965  
LEWIS-126

Colloid composed of finely ground iron oxide in a fluid such as heptane, is controlled and directed magnetically in a zero gravity environment. It will not separate on standing for long periods or after exposure to magnetic or centrifugal forces. Because of its low density and low viscosity, it is easily pumped.

B65-10336

ANODIZATION PROCESS PRODUCES OPAQUE,

REFLECTIVE COATINGS ON ALUMINUM

INNOVATOR NOT GIVEN /LOCKHEED MISSILES AND SPACE  
CO./ NOV. 1965  
M-FS-348

Opaque, reflective coatings are produced on aluminum articles by an anodizing process wherein the anodizing bath contains an aqueous dispersion of finely divided insoluble inorganic compounds. These particles appear as uniformly distributed occlusions in the anodic deposit on the aluminum.

B65-10337

SPECIAL COATINGS CONTROL TEMPERATURE OF  
STRUCTURES  
FULK, M. M. MAYER, R. W. /BALL BROTHERS RES.  
CORP./ NOV. 1965  
GSFC-444

Special coatings in the form of paints that exhibit controlled ratios of sunlight absorptivity to grey-body emissivity control the temperature of structures in space flight. These finishes exhibit good resistance to ultraviolet radiation and do not discolor.

B65-10341

LIGHTWEIGHT HINGED BELLOWS RESTRAINT HAS  
HIGH LOAD CAPACITY  
IMUS, E. E. /N. AM. AVIATION/ NOV. 1965  
WOO-151

High angular stresses in fluid-handling ducts are accommodated by a lightweight hinged bellows restraint. This device transmits angular stress to points close to the axis center and spreads it over a rigid configuration.

B65-10344

SOLUBLE UNDERCOATING FACILITATES REMOVAL OF  
FOAMED-IN-PLACE INSULATION  
DUNCAN, A. C. HILL, C. L., JR. NOV. 1965  
LEWIS-193

Foamed-in-place insulation can be removed and reused by coating the surface with a soluble peel coat before applying the foam mixture. Removal of the insulation is effected by slitting it and pouring a solvent in the slit to dissolve the peel coat. The insulation can then be stripped off intact.

B65-10354

PIGMENTED COATING RESISTS THERMAL SHOCK  
HARADA, Y. RECHTER, H. L. /IIT RES. INST./ NOV.  
1965  
JPL-SC-083

Coating pigment composed of zinc oxide and potassium silicate resists the effects of thermal shock and long exposure to direct sunlight.

B65-10357

AIR-CURED CERAMIC COATING INSULATES AGAINST  
HIGH HEAT FLUXES  
SEITZINGER, V. F. NOV. 1965  
M-FS-150

Reflective insulating ceramic coating protects supporting structures in area adjacent to rocket engines from the intense heat fluxes in the rocket exhaust plumes.

B65-10364

POROUS GLASS MAKES EFFECTIVE SUBSTRATE FOR  
OZONE-SENSING REAGENT  
INNOVATOR NOT GIVEN /PARAMETRICS/ DEC. 1965  
GSFC-388

Porous-glass substrate is used for absorption of a dye used in measuring the concentration of atmospheric ozone at high altitudes. This measurement is based on the chemiluminescence produced in the reaction between ozone and the dye, rhodamine b. The porous glass provides a large interstitial surface area which promotes this reaction.

B65-10366

UNIQUE GEAR DESIGN PROVIDES SELF-LUBRICATION  
WINIARSKI, F. J. /SPACE TECHNOL. LAB./ DEC. 1965  
JPL-SC-079

Composite gear configuration provides a reliable automatic means for replenishing gear mechanism lubricants that dissipate in the harsh environment of space. The center or hub section of the

gear consists of a porous, oil-impregnated material, and the outer or toothed section has radially drilled passages to cause the oil to gradually flow to the gear teeth surfaces.

B65-10372

WIRE BUNDLE FORMED INTO GRIDS WITH MINUTE INTERSTICES

TODD, H. H. /ELECTRO-OPT. SYSTEMS/ DEC. 1965  
WOO-089

Deforming the ends of a bundle of closely packed parallel wires to restrict the interstices to substantially uniform and minute dimensions produces grids or filters for ion engines. Porous metal structures made by this process are also used as fuel cell electrodes, diffusion membranes, and catalysts.

B65-10374

PLASTIC PLUS STAINLESS-STEEL FIBERS MAKE RESILIENT, IMPERMEABLE MATERIAL

SMIRRA, J. R. /THOMPSON RAMO WOOLDRIDGE/ DEC. 1965  
WOO-246

Plastic material combined with stainless-steel fibers and molded under heat and pressure into a desired configuration is both soft enough to deform under a load and resilient enough to return to its original shape when the load is removed.

B65-10384

PROBE SAMPLES COMPONENTS OF ROCKET ENGINE EXHAUST

SCHUMACHER, P. E. /N. AM. AVIATION/ DEC. 1965  
M-FS-485

Water-cooled, cantilevered probe samples the exhaust plume of rocket engines to recover particles for examination. The probe withstands the stresses of a rocket exhaust plume environment for a sufficient period to obtain a useful sample of the exhaust components.

B65-10390

TEST STRIPS DETECT DIFFERENT CO<sub>2</sub> CONCENTRATIONS IN CLOSED COMPARTMENTS

INNOVATOR NOT GIVEN /MELPAR/ DEC. 1965  
MSC-210

Four different test strips, using crystal violet for one pair of strips and basic fuchsin as a dye for the second pair, give unambiguous colorimetric indications of four different concentrations of carbon dioxide in the atmosphere of a closed compartment. Tetraethylene pentamine is used as a dye decoloring agent.

B65-10397

NEW BRAZING ALLOY ELIMINATES METAL-STRESS CRACKING

HUSCHLER, E., JR. ROEDER, E. R. /N. AM. AVIATION/ DEC. 1965  
WOO-249

Silver 15 zinc brazing alloy avoids the liquid-metal stress cracking of base metals when applied to 347, 316, and 410 stainless steels and certain other alloys.

B65-10398

NICKEL/TIN COATING PROTECTS THREADED FASTENERS IN CORROSIVE ENVIRONMENT

CHARLES, J. VEEDER, L. /N. AM. AVIATION/ DEC. 1965  
MSC-253

Threaded fasteners used in corrosive environments are plated with electroless nickel and electroplated, over the nickel, with tin. This provides a corrosion-resistant coating for the fasteners.

## 04 LIFE SCIENCES

B63-10003

NEW LOW-LEVEL A-C AMPLIFIER PROVIDES ADJUSTABLE NOISE CANCELLATION AND AUTOMATIC TEMPERATURE COMPENSATION

SMITH, J. R., JR. MAR. 1964  
ARC-2

A circuit utilizing a transistorized differential amplifier is developed for biomedical use. This

low voltage operating circuit provides adjustable cancellation at the input for unbalanced noise signals, and automatic temperature compensation is accomplished by a single active element across the input-output ends.

B64-10025

IMPROVED ELECTRODE GIVES HIGH-QUALITY BIOLOGICAL RECORDINGS

DAY, J. L. LIPPITT, M. W. MAY 1964  
MSC-17

To obtain high quality waveforms from a subject engaged in physical activity, an improved electrode assembly has been devised. This consists of a cup containing an electrically conductive paste and a silver electrode. The paste maintains contact between the skin and the plate.

B64-10108

DEVICE INDUCES LUNGS TO MAINTAIN KNOWN CONSTANT PRESSURE

LIPPITT, M. W. REED, J. H. JUL. 1964  
MSC-50

This device requires the use of thoracic muscles to maintain prescribed air pressure in the lungs for brief periods. It consists of a clear plastic hollow cylinder fitted with a mouthpiece, a spring-loaded piston, and a small vent for escaping air when exhalation into the mouthpiece displaces the piston.

B64-10146

TECHNIQUE SIMULATES EFFECT OF REDUCED GRAVITY

HEWES, D. E. SPADY, A. A. JR. JUN. 1964  
LANGLEY-44

To simulate the effects of lunar gravity, an arrangement of near-vertical cables has been devised. These suspend the test subject perpendicular to an inclined walkway to give the effect of reduced gravitational pull.

B65-10332

TEST MONKEYS ANESTHETIZED BY ROUTINE PROCEDURE

INNOVATOR NOT GIVEN /SPACE/DEFENSE CORP./ NOV. 1965  
HQ-18

Test monkeys are safely anesthetized for five minutes by confining them for less than six minutes in enclosures containing a controlled volume of ether. Thus the monkeys can be properly and safely positioned on test couches and fitted with electrodes or other devices prior to physiological tests.

## 05 BIOTECHNOLOGY

B63-10007

HIGH PURITY ELECTROFORMING YIELDS SUPERIOR METAL MODELS

HAEFELI, R. M. HOUSTON, J. P. JAN. 1964  
ARC-6

Ultrasonic electroforming has proven successful in making high purity metal models for heat transfer studies. This process provides smooth, pit-free models.

B63-10008

VACUUM FORMING OF THERMOPLASTIC SHEET RESULTS IN LOW-COST INVESTMENT CASTING PATTERNS

CLARKE, A. E., JR. MAR. 1964  
ARC-7

Vacuum forming of a sheet of thermoplastic material around a mandrel conforming to the shape of the finished object provides a pattern for an investment mold. The thickness of the metal part is determined by the thickness of the plastic pattern.

B63-10009

CHAIN FRICTION SYSTEM GIVES POSITIVE, REVERSIBLE DRIVE

DAVIDSEN, J. S. APR. 1964  
ARC-8

By cementing a strip of an elastomer to the smooth metal rim of the pulley and neoprene covered

## 05 MECHANICAL

idlers providing suitable tension to the chain around the pulley, a positive reversible drive is accomplished more quietly and with less vibration.

**B63-10023**  
**V-SLOTTED SCREW HEAD AND MATCHING DRIVING TOOL**  
**FACILITATE INSERTION AND REMOVAL OF SCREW**  
**FASTENERS**

HANDLEY, M. G. JAN. 1964  
 FRC-16

A V-slotted designed screw and a screwdriver with a V-shaped tang facilitate driving the screw into difficult locations and minimize axial forces thus avoiding damage to the screw.

**B63-10123**  
**ELASTIC ORIFICE AUTOMATICALLY REGULATES GAS**  
**BEARINGS**  
 BATSCH, F. LAUB, J. L. JUN. 1964  
 JPL-135

An elastic, pressure-sensitive orifice is used to automatically regulate the rate of gas flow into bearings under varying loads. Formed of a molded elastomer, tests show these orifices increase the stability of gas bearings.

**B63-10139**  
**METHOD OF WELDING JOINT IN CLOSED VESSEL**  
**IMPROVES QUALITY OF SEAM**  
 FREEMAN, R. LEVOE, C. MAY 1964  
 JPL-170

To facilitate welding of closed vessels, a metal backup strip is used at the junction inside the vessel. After welding from the outside, this strip is dissolved by a chemically reactive solvent poured through a filler hole into the vessel.

**B63-10141**  
**VENTED PISTON SEAL PREVENTS FLUID LEAKAGE**  
**BETWEEN TWO CHAMBERS**  
 MAC GLASHAN, W. F. MORRISON, R. DEC. 1964  
 JPL-179

To prevent fluid leakage around piston seals separating two fluids under differential pressure, a venting system has been devised. Two methods may be used for venting seals through internal passages to an external low-pressure area, O-ring or split-ring seals.

**B63-10143**  
**COINCIDENT SWITCH CLOSING REDUCES ERROR IN**  
**MOTOR-DRIVEN TIMER**  
 RICH, S. DEC. 1964  
 JPL-182

To cut the lag-lead in motor-driven timing devices, the timing circuit has been extended to include a second switch. This is actuated in time with the first but driven directly at a speed  $x$  times faster than the first.

**B63-10170**  
**HIGH-PRESSURE REGULATING SYSTEM PREVENTS**  
**PRESSURE SURGES**  
 KELLER, O. F. MAC GLASHAN, W. F. JUN. 1964 /SEE  
 U.S. PATENT NO. 3,105,515/  
 JPL-231

Gas flow is controlled by means of a pressure regulating system which prevents pressure surges. A high-pressure fluid source, a spring-loaded fluid-damped regulator valve, an accumulator, a conventional normally closed command valve, and a control valve are the main components.

**B63-10198**  
**DEVICE TRANSMITS ROTARY MOTION THROUGH HERMET-**  
**ICALLY SEALED WALL**  
 PORTER, R. N. APR. 1964  
 JPL-303

A wobble plate, metal bellows, and two shafts, assembled in a four-section housing, make it possible to transmit rotary motion through a hermetically sealed wall. In operation a rotational torque is developed by the wobble plate.

**B63-10200**  
**APPARATUS OF SMALL SIZE CAN BE EXTENDED INTO**  
**LONG, RIGID BOOM**

MILLER, J. V. MAY 1964  
 JPL-305

Three metal sheets, having prenotched edges, are interlocked as they are unrolled from three feed rollers, which form a triangle. The apparatus is relatively small, and the sheets can be erected into a rigid triangular boom of considerable length.

**B63-10226**  
**SELF SEALING DISCONNECT FOR TUBING FORMS METAL**  
**SEAL AFTER BREAKAWAY**  
 GERNANDT, H. H. JAN. 1964  
 JPL-354

Disconnect fittings form a positive metal seal when the fill tube pulls against a metal sleeve when disconnected by force. A specially designed sleeve surrounds the fill tube. O-rings in the shoulder of the sleeve and near the outer end of the fill tube seal against leakage.

**B63-10228**  
**PACKLESS VALVE WITH ALL-METAL SEAL HANDLES**  
**WIDE TEMPERATURE, PRESSURE RANGE**  
 MAC GLASHAN, W. F. MAR. 1964  
 JPL-361

A durable line valve utilizes stacked metal disks to seal off an inlet port. No packing or shaft sealing is needed, and the valve operates satisfactory over a wide temperature and pressure range.

**B63-10236**  
**LIGHTWEIGHT UNIVERSAL JOINT TRANSMITS BOTH**  
**TORQUE AND THRUST**  
 BAMFORD, R. M. JAN. 1964  
 JPL-375

A lightweight universal joint uses a thin steel flexure plate to transmit torque and a steel rod to transmit thrust. Both the plate and rod are independently mounted and can act individually.

**B63-10237**  
**SUPERCOLD TECHNIQUE DUPLICATES MAGNETIC FIELD**  
**IN SECOND SUPERCONDUCTOR**  
 HILDEBRANDT, A. F. NOV. 1964  
 JPL-376

A superconductor cylinder, charged with a high magnetic field, can be used to create a similar field in a larger cylinder. The uncharged cylinder is precooled, lowered into a helium dewar system, and fitted around the cylinder with the magnetic field. Magnetic flux lines pass through the two cylinders.

**B63-10240**  
**SLEEVE AND CUTTER SIMPLIFY DISCONNECTING**  
**WELDED JOINT IN TUBING**  
 PERKINS, G. S. APR. 1964  
 JPL-384

To test equipment, welded tubing joints may have to be disconnected and rewelded. To eliminate rewelding, a nonstandard welding sleeve permits the tubing to be welded and then disconnected by a specially designed sleeve cutter. Use of this tool assures that only the sleeve is cut.

**B63-10241**  
**VEITCH DIAGRAM PLOTTER SIMPLIFIES BOOLEAN**  
**FUNCTIONS**  
 RUBIN, D. K. APR. 1964  
 JPL-385

This device for simplifying the plotting of a veitch diagram consists of several overlays for blocking out the unwanted squares. This method of plotting the various input combinations to a computer is used in conjunction with the boolean functions.

**B63-10247**  
**NEW PACKAGE FOR BELLEVILLE SPRING PERMITS RATE**  
**CHANGE, EASY DISASSEMBLY**  
 MAC GLASHAN, W. F. MAR. 1964  
 JPL-392

A spring package, with grooves to hold the spring washers at the inner and outer edges, reduces hysteresis to a minimum. Three-segment retainers permit easy disassembly so that the spring rate can be changed.

**B63-10251**  
**HELICAL TUBE SEPARATES NITROGEN GAS FROM LIQUID NITROGEN**  
 STEPHENS, J. B. JUN. 1964  
 JPL-398

To prevent a boiloff problem, liquid nitrogen flowing from a storage tank to a container, is separated into liquid and gaseous components. This is accomplished by centrifugal and venting action, using a section of perforated helical aluminum tubing.

**B63-10289**  
**FRICTIONAL WEDGE SHOCK MOUNT IS INEXPENSIVE, HAS GOOD DAMPING CHARACTERISTICS**  
 TENER, W. M. MAY 1964  
 JPL-IT-1001

A wedge-shaped shock mount uses rubber for energy absorption, and the frictional characteristics of ordinary brake material for damping.

**B63-10291**  
**SPECIAL PLIERS CONNECT HOSE CONTAINING LIQUID UNDER PRESSURE**  
 BLAYDES, R. A. MAR. 1964  
 JPL-IT-1003

For speed and safety in handling disconnect fittings on a hose carrying liquid under pressure, special pliers have been constructed. A gear and rack mechanism is combined with two or more wide-opening U-shaped jaws which are placed over the quick-disconnect fittings.

**B63-10292**  
**HEAVY-DUTY STAPLE REMOVER OPERATED BY HAND**  
 MORRISON, T. RENNER, R. MAR. 1964  
 JPL-IT-1004

To remove staples from thick reports, a rooter, bending hook and post are incorporated into a heavy duty hand tool. This makes possible one-step extraction of long staples.

**B63-10304**  
**BREAK-UP OF METAL TUBE MAKES ONE-TIME SHOCK ABSORBER, BARS REBOUND**  
 HATHAWAY, M. MC GEHEE, J. R. ZAVADA, E. FEB. 1964 /SEE NASA-TN-D-1477/  
 LANGLEY-1A

A frangible metal tube has the capability to dissipate the energy generated when a vehicle lands with excessive velocity. The tube is so placed that, at impact, it is forced against a die and, as it fragments, energy is absorbed.

**B63-10340**  
**CRYOPUMPING OF HYDROGEN IN VACUUM CHAMBERS IS AIDED BY CATALYTIC OXIDATION OF HYDROGEN**  
 CHILDS, J. H. GROBMAN, J. RAYLE, W. JUN. 1964  
 /SEE NASA-TN-D-863/  
 LEWIS-15

Vacuum test facilities are required for high speed cryopumping of gaseous hydrogen at low pressures. One method involves the catalytic oxidation of hydrogen and condensation of the resulting water on a liquid nitrogen-cooled surface.

**B63-10341**  
**DESIGN OF VALVE PERMITS SEALING EVEN IF THE STEM IS MISALIGNED**  
 SCHMIDT, H. W. JAN. 1964  
 LEWIS-38

A conical-walled valve plug is designed to seal against a recessed spherical valve seat. This insures proper sealing during numerous seating cycles even though the valve stem is misaligned or forced out of its proper axis.

**B63-10354**  
**RAPID BILLET LOADER AIDS EXTRUSION OF REFRACTORY METALS**  
 DOLINSHEK, A. F. HERMAN, L. E. APR. 1964  
 LEWIS-50

A combination gravity and manually powered rapid billet loader reduces the time required for transferring hot metal billets from a heating furnace to an extrusion press. Positioned between the furnace and extrusion press, this loader is a simple slide-delivery device.

**B63-10367**  
**CONNECTOR FOR VACUUM-JACKETED LINES CUTS TUBING SYSTEM COST**  
 CALVERT, H. F. MAY 1964  
 LEWIS-66

A low-cost fitting, fabricated from standard connectors, is used for disconnecting flow lines in cryogenic systems. Utilizing vacuum-jacketed lines made from two sizes of tubing welded at the ends, the connectors are stronger and setup time is reduced.

**B63-10368**  
**COMPOSITE, VACUUM-JACKETED TUBING REPLACES BELLOWS IN CRYOGENIC SYSTEMS**  
 CALVERT, H. F. JUN. 1964  
 LEWIS-67

For reliability control of high pressure cryogenic systems, one or more 90 degree elbow expansion devices are substituted for the metal bellows normally used. The device consists of a conducting tube inside a support tube, with the space between the tubes evacuated for insulation.

**B63-10376**  
**NOVEL CLAMPS ALIGN LARGE ROCKET CASES, ELIMINATE BACK-UP BARS**  
 FRANKLIN, W. J. MARTIN, N. C. JAN. 1964  
 M-FS-1

Welding clamps, placed inside and outside a rocket case, hold it in proper alignment during tungsten inert gas welding. These metal blocks, connected by a stainless steel band, eliminate the need for backup bars.

**B63-10384**  
**VACUUM-TYPE BACKUP BAR SPEEDS WELD REPAIRS**  
 CARMODY, R. J. AUG. 1964  
 M-FS-12

A backup bar designed to use both vacuum and air pressure provides a method of sealing the weld root of a faulty section of seam weld. With slight redesign, the bar can be made sufficiently flexible to fit any large cylindrical surface.

**B63-10385**  
**FLEXIBLE HONEYCOMB STRUCTURE CAN BEND TO FIT COMPOUND CURVES**  
 CARMODY, R. J. APR. 1964  
 M-FS-13

For flexibility in forming a curved surface, a honeycomb configuration using multiple pleats has proved superior to the usual core structures. The partial pleats formed in individual cell walls permit movements to and from the central axis without tearing.

**B63-10387**  
**PORTABLE FLOORING PROTECTS FINISHED SURFACES, IS EASILY MOVED**  
 CARMODY, R. J. MAR. 1964  
 M-FS-15

To protect curved, finished surface and provide support for workmen, portable flooring has been made from rigid plastic foam blocks, faced with aluminum strips. Held together by nylon webbing, the flooring can be rolled up for easy carrying.

**B63-10420**  
**SIMPLE MECHANISM COMBINES POSITIVE LOCKING AND QUICK-RELEASE FEATURES**  
 CLAYTON, L. B. /HUGHES AIRCRAFT CO./ FEB. 1964  
 WOO-4

For secure locking and quick release of two objects, this device uses a spring-loaded slotted bolt, locked in position by two retainer arms. When these retainer arms are freed from contact, the bolt is ejected and the objects released.

**B63-10431**  
**HIGH-TEMPERATURE, HIGH-PRESSURE SPHERICAL SEGMENT VALVE PROVIDES QUICK OPENING**  
 GIOVANNETTI, A. HIMMELRIGHT, R. MEYER, K. NITTA, H. APR. 1964  
 ARC-13

A hollow spherical segment valve with an eccentric permits non-rubbing closure and provides a means for gas-cooling the seal. The design allows quick opening at high temperatures and discharge

pressures.

**B63-10435**  
PORTABLE DISPLAY PANELING HAS WIDE USE, EASY  
TAKE DOWN AND ASSEMBLY  
DEVOTO, H. J., JR. MAR. 1964  
ARC-17

Design for a modular display panel is based on a cross-shaped corner connector and wooden lattice bars. The bars are fitted into the arms of the metal connector and a pocket slot holds a modular-size panel.

**B63-10442**  
KINETIC-ENERGY ABSORBER EMPLOYS FRICTIONAL  
FORCE BETWEEN MATING CYLINDERS  
CONRAD, E. W. MAY 1964  
LEWIS-75

A kinetic energy absorbing device uses a series of coaxial, mating cylindrical surfaces. These surfaces have high frictional resistance to relative motion when axial impact forces are applied. The device is designed for safe deceleration of vehicles impacting on landing surfaces.

**B63-10489**  
FINE-PARTICLE FILTER PREVENTS DAMAGE TO VACUUM  
PUMPS  
HARLAMERT, P., JR. APR. 1964  
LEWIS-106

A filter system for mechanical pumps is designed with a baffle assembly that rotates in a circulating oil bath which traps destructive particles. This prevents severe damage to the pump and is serviceable for long periods before it requires cleaning.

**B63-10497**  
INTEGRAL COOLANT CHANNELS SIMPLY MADE BY MELT-  
OUT METHOD  
ESCHER, W. J. D. JUN. 1964  
M-FS-91

A melt-out method of constructing strong, pressure-tight fluid coolant channels for chambers is accomplished by cementing pins to the surface and by depositing a melt-out material on the surface followed by two layers of epoxy-resin impregnated glass fibers. The structure is heated to melt out the low-melting alloy.

**B63-10502**  
FLUID-PRESSURE METER CAN BE CALIBRATED WITHOUT  
REMOVAL FROM FLOW LINE  
MELTON, D. E. MAR. 1964  
M-FS-98

The construction of a fluid pressure meter with two inlet ports, flexible diaphragms and a pressure-responsive transducer is described. One port can be connected to the line and the other to a source of standard pressures for calibration.

**B63-10517**  
MINIATURE OXYGEN-HYDROGEN CUTTING TORCH  
CONSTRUCTED FROM HYPODERMIC NEEDLE  
SHLICHTA, P. APR. 1964  
JPL-545

A miniature cutting torch consisting of a main body member, upon which the hydrogen and oxygen containers are mounted, valves for controlling gas flow, and a hypodermic needle that acts as a mixing tube and flame tip is constructed.

**B63-10519**  
TOOL FACILITATES SEALING OF METAL FILL TUBES  
COOLEY, H. H., JR. /UNITED AIRCRAFT CORP./ JUL.  
1964  
MSC-24

A hand tool is designed for sealing metal fill tubes containing corrosive or inflammable liquids without the use of heat or open flame. The tool aligns the fill tube into which a tapered sealing pin is dropped and driven below the neck of tube.

**B63-10526**  
BUILT-IN TEMPLATES SPEED UP PROCESS FOR MAKING  
ACCURATE MODELS  
INNOVATOR NOT GIVEN FEB. 1964  
LANGLEY-23

From accurate scale drawings of a model, photographic negatives of the cross sections are printed on thin sheets of aluminum. These cross-section images are cut out and mounted, and mahogany blocks placed between them. The wood can be worked down using the aluminum as a built-in template.

**B63-10530**  
NEW ANEMOMETER HAS FAST RESPONSE, MEASURES  
DYNAMIC PRESSURE DIRECTLY  
LYNCH, J. W. REED, W. H., III OCT. 1964  
LANGLEY-28

A simple anemometer having a fast response to high frequency wind fluctuations by direct measurement of two drag-force components in orthogonal planes is described. It may be used to determine wind profiles to extensive heights and would be helpful in takeoff and landing of light planes.

**B63-10547**  
ELLIPSOIDAL OPTICAL REFLECTORS REPRODUCED BY  
ELECTROFORMING  
HUNGERFORD, W. J. LARMER, J. W. LEVINSOHN, M.  
OCT. 1964  
GSFC-92

An accurately dimensioned convex ellipsoidal surface, which will become a master after polishing, is fabricated from 316L stainless steel. When polishing of the master is completed, it is suspended in a modified watt bath for electroforming of nickel reflectors.

**B63-10556**  
LATHE CONVERTED FOR GRINDING ASPHERIC SURFACES  
LARMER, J. W. LEVINSOHN, M. MC CRAW, D.  
PESSAGNO, E. H. TAUB, F. J. JUL. 1964  
GSFC-115

A standard overarm tracing lathe converted by the addition of an independently driven diamond grinding wheel is used for grinding aspheric surfaces. The motion of the wheel is controlled by the lathe air tracer following the template which produces the desired aspheric profile.

**B63-10558**  
NEW METHOD FORMS BOND LINE FREE OF VOIDS  
KING, C. B. OCT. 1964  
LANGLEY-20

A new bonding method using vacuum, pressure and heat, which produces a bond line free of voids, is described. This method is very successful in bonding ablation shields to a magnesium structural component in simulated reentry tests involving great heat and air turbulence.

**B63-10560**  
CAMERA SHUTTER IS ACTUATED BY ELECTRIC SIGNAL  
NEFF, J. E. NOV. 1964  
ARC-20

A rotary solenoid energized by an electric signal opens a camera shutter and when the solenoid is de-energized a spring closes it. By the use of a microswitch, the shutter may be opened + closed in one continuous, rapid operation when the solenoid is actuated.

**B63-10564**  
A TECHNIQUE FOR MAKING ANIMAL RESTRAINTS  
CLARKE, A. E., JR. REITMAN, J. SEP. 1964  
ARC-25

A contoured shell for restraining animals is made by thermoforming plastic over the anesthetized, frozen specimen. It may be vented, or pieces may be cut out to facilitate working in localized areas.

**B63-10568**  
PLASTIC MOLDS REDUCE COST OF ENCAPSULATING  
ELECTRIC CABLE CONNECTORS  
KNOTT, D. NOV. 1964  
M-FS-69

Resin casting of the aluminum master pattern forms a plastic mold for encapsulating a cable connector. An elastomer is injected into the mold and cured. The mold is disassembled leaving an elastomeric encapsulation around the connector.

**B63-10571**  
**SELF-BALANCING BEAM PERMITS SAFE, EASY LOAD**  
**HANDLING UNDER OVERHANG**  
 EDWARDS, D. H. MAR. 1964  
 M-FS-84

The use of a self-balancing I-beam with a counterweight and motor simplifies moving heavy loads that are inaccessible for cranes. The beam cannot be overloaded, as the counterweight will not balance the load, and thus acts as an automatic safety device.

**B63-10590**  
**STAINLESS-STEEL ELBOWS FORMED BY SPIN FORGING**  
**INNOVATOR NOT GIVEN /CHANCE-VOUGHT CORP./ DEC.**  
 1964  
 M-FS-122

Large seamless austenitic stainless steel elbows are fabricated by spin forging /rotary shear forming/. A specially designed spin forging tool for mounting on a hydrospin machine has been built for this purpose.

**B64-10001**  
**NEW INFLATABLE LIFERAFT IS NONTIPPABLE**  
 RADNOFSKY, M. I. SHEWMAKE, G. A. MAR. 1964 /SEE  
 NASA-TN-D-1083/  
 MSC-4A

A one-seamed lightweight life raft has three underwater ballast buckets as stabilizers. Nontippable, it can be compactly packaged and inflated with carbon dioxide.

**B64-10006**  
**SPEED-SENSING DEVICE AIDS CRANE OPERATORS**  
 MC FORD, E. L. OCT. 1964  
 WS-4

So that crane operators can judge payload movements accurately, a friction-driven multilobed cam device energizes a buzzer and indicator lamp in the crane cab. The signal frequency of this speed sensor has a sensitivity to hoist movement of 1/8 inch.

**B64-10011**  
**METAL STRIP FORMS 21 FOOT BOOM, ROLLS UP FOR**  
**COMPACT STORAGE**  
 INNOVATOR NOT GIVEN /CANADIAN COMMERCIAL CORP./  
 MAY 1964  
 GSFC-151

An extensible boom, carrying three separate electric conductor tapes, can be rolled into a compact storage drum. The tape is curved in cross section so that the boom automatically forms a tube as it is extended.

**B64-10014**  
**GUIDE FOR EXTRUSION DIES ELIMINATES**  
**STRAIGHTENING OPERATION**  
 GYORGAK, C. A. HOOVER, R. J. NOV. 1964  
 LEWIS-152

To prevent distortion of extruded metal, a guidance assembly is aligned with the die. As the metal emerges from the extrusion dies, it passes directly into the receiver and straightening tube system, and the completed extrusion is withdrawn.

**B64-10015**  
**COMFORTABLE, LIGHTWEIGHT SAFETY HELMET HOLDS**  
**RADIO TRANSMITTER, RECEIVER**  
 ATLAS, N. D. /N. AM. AVIATION, INC./ MAY 1964  
 MSC-53

For two-way radio communication where safety gear is required, a lightweight helmet with few protrusions has been designed. The electronics components and power supply are mounted between the inner and outer shells, and resilient padding is used for the lining.

**B64-10021**  
**PRESSURE TRANSDUCER 3/8-INCH IN SIZE CAN BE**  
**FAIRED INTO SURFACE**  
 SCHAFFER, R. J. /N. AM. AVIATION, INC./ MAY 1964  
 WDO-065

To measure fluid pressure with minimum disturbance to fluid flow, a miniature pressure transducer can be imbedded and faired into the test surface. Incorporated in the design are piezoresistive elements, mounted on a diaphragm, which transform pressure strains into an electrical signal.

**B64-10028**  
**QUICK-ACTING CLUTCH DISENGAGES IDLE DRIVE**  
**MOTOR**  
 STARK, K. W. AUG. 1964  
 GSFC-143

Positive-drive, no drag, over-running clutch is developed to conserve power of idle motor in a low-power system using multiple drive motors. This device is useful where a number of shaft speeds are required with frequent shifting.

**B64-10031**  
**MULTIPLE PORT PRESSURE SCANNER VALVE FEATURES**  
**GREATER ACCURACY, QUICKER DATA**  
 VINCENT, E. R. SEP. 1964  
 JPL-555

A fast, accurate, multipressure measuring system, which employs a multiple port pressure scanning valve that connects a pressure transducer to many pressures, is described.

**B64-10050**  
**MODIFIED GAS BEARING IS ADJUSTABLE TO OPTIMUM**  
**STIFFNESS RATIO**  
 EVANS, J. L. AUG. 1964  
 M-FS-145

Inexpensive and rapid-adjustments of the radial-to-axial stiffness ratio of a spherical gas bearing are achieved by a series of gas passages in the equatorial plane of the sphere which feed into orifices that can be readily changed in size.

**B64-10058**  
**INSULATED WELD TOOLING PERMITS UNIFORM, HIGH-**  
**QUALITY WELD**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ AUG. 1964  
 MSC-42

The application of a ceramic material coating to all surfaces contacting parts to be welded permits greater weld strength than the conventional weld tooling method.

**B64-10066**  
**ENCAPSULATION PROCESS STERILIZES AND PRESERVES**  
**SURGICAL INSTRUMENTS**  
 MONTGOMERY, L. C. MORELLI, F. A. JUL. 1964  
 JPL-484

Ethylene oxide is blended with an organic polymer to form a sterile material for encapsulating surgical instruments. The material does not bond to metal and can be easily removed when the instruments are needed.

**B64-10069**  
**METAL-BENDING BRAKE FACILITATES LIGHTWEIGHT,**  
**CLOSE-TOLERANCE FABRICATION**  
 ERCOLINE, A. L. WILTON, K. B. OCT. 1964  
 ARC-29

A lightweight, metal bending brake ensures very accurate bends. Features of the brake that adapt it for making complex reverse bends to close tolerances are a pronounced relief or cutaway of the underside of the bodyplate combined with modification in the leaf design and its suspension.

**B64-10084**  
**MOLDED ELASTOMER PROVIDES COMPACT FERRITE-CORE**  
**HOLDER, SIMPLIFIES ASSEMBLY**  
 HAYDEN, R. R. NOV. 1964  
 JPL-584

A ferrite-core holder, fabricated by casting an elastomer in a simple mold, simplifies the assembly of modular matrix units for computers. Use of the device permits the core leads to be multiply threaded and soldered to terminals, without requiring intermediate terminals.

**B64-10119**  
**BUCKLE JOINS WEB STRAPS QUICKLY, ADJUSTS**  
**EASILY**  
 WILKINSON, J. E. /CHANCE VOUGHT CORP./ JUN. 1964  
 LANGLEY-21

To join web straps used to hoist heavy loads, a novel buckle permits two straps to be quickly joined and held by the combined forces of strap load tension and friction.

- B64-10121**  
ELECTRONIC ASSEMBLY RACK PANELS SNAP ON AND OFF  
BAILEY, J. W. JUN. 1964  
GSFC-59  
Snap fasteners on each side of an electronic assembly rack blank panel give quick access to the interior. Guide pins extending from the inside face easily slip into standard screw holes on the frame and provide additional support.
- B64-10124**  
ATTACHMENT CONVERTS MICROSCOPE TO POINT SOURCE AUTOCOLLIMATOR  
SHLICHTA, P. J. JUL. 1964  
JPL-499  
A low-power microscope or telescope provides a simple means of autocollimation. This is done by fitting the instrument with a light source to permit alignment from a reflecting surface normal to the optic axis of the instrument.
- B64-10130**  
BEARING TRANSMITS ROTARY AND AXIAL MOTION  
DOW, N. F. PETERS, R. W. SEP. 1964  
LANGLEY-27  
A low friction, two-component bearing comprised of a pair of ball-bearing races for transmitting rotary motion and an inner series of ball bearing assemblies for transmitting axial motion is described and should be useful in mechanisms such as stress-strain testing machines.
- B64-10141**  
PNEUMATIC POWER IS TRANSMITTED THROUGH AIR BEARING  
JOHNSON, H. I. WOBIG, O. A. JUL. 1964  
MSC-8  
A more efficient method for supplying high pressure air to an air bearing and pneumatic equipment mounted on it has been developed. The system uses a conventional air bearing and an air-supported sphere with a central passage. High pressure air is channeled through it into the pneumatic equipment on the sphere.
- B64-10145**  
FLEXIBLE FASTENER ALLOWS THERMAL EXPANSION  
CRUMPLER, W. B. JUN. 1964  
LANGLEY-40  
A flexible fastener permits thermal expansion of model skin sections which are rigidly attached to supporting structures in wind tunnel tests. The device uses a modified ball joint contact between the fastener and a skin section.
- B64-10164**  
UPSETTING BUTT EDGE INCREASES WELD-JOINT STRENGTH  
VESCO, D. OCT. 1964  
M-FS-175  
Mechanical upsetting /a mode of cold forging/ of butt edges to be welded is accomplished by the use of hydraulic rams and pressure rollers. The mechanical upsetting increases the thickness of the material in the heat-affected zone and compensates for the lower specific strength per unit thickness common to this area.
- B64-10170**  
BALL BEARING USED IN DESIGN OF RUGGED FLOW-METER  
MINKIN, H. L. JAN. 1965  
LEWIS-159  
A volumetric flowmeter which has a small magnet imbedded in the outer perimeter of the turbine wheel or in the bearing permits measurement of liquid flow rates in the presence of wide ranges and violent surges.
- B64-10178**  
MACHINE TESTS CREASE DURABILITY OF SHEET MATERIALS  
JONES, L. K. STANFORD, H. B. NOV. 1964  
JPL-604  
To test the crease resistance of sheet materials, the mid-section is folded over crease-control blades. One end is clamped to a motor-driven eccentric, the other to a spring, and durability
- is measured by the cycles required to produce failure.
- B64-10185**  
THREADING HOOK FACILITATES SAFE RECOVERY OF HEAVY LOADS  
ARTHUR, J. S. WILLIAMS, D. C. OCT. 1964  
MSC-46  
A C-shaped threading hook and shuttle mounted on a spring-loaded driving rod located inside the long-handled pole are developed for recovering massive loads afloat in the sea.
- B64-10188**  
BLADE VALVE ISOLATES COMPARTMENT IN PIPE, OPENS TO ALLOW FREE FLOW  
IMUS, R. NOV. 1964  
JPL-585  
Two thin blades are incorporated into a valve which, when closed, form a sealed compartment in the shock-tube portion of a pipeline. When forced open by an actuator, gas flows through the system.
- B64-10211**  
MICROMACHINING PRODUCES OPTICAL APERTURES TO MICRON DIMENSIONS  
WALCH, A. J. OCT. 1964  
GSFC-206  
A micron dimensioned rectangular optical aperture is formed under a high-powered toolmaker's microscope by laying two knife-edged blocks over the miniature knife-edged hole in the base.
- B64-10223**  
TWO-PART VALVE ACTS AS QUICK COUPLING  
MAC GLASHAN, W. F., JR. NOV. 1964  
JPL-478  
A two-part valve simplifies the problem of filling large tanks from smaller ones. One part acts as a check valve and remains integral to the recipient system, while the other part is integral to the donor system.
- B64-10249**  
INSTRUMENT ADJUSTMENT KNOB LOCKS TO PREVENT ACCIDENTAL MALADJUSTMENT  
INNOVATOR NOT GIVEN /LEAR SIEGLER CORP./ NOV. 1964  
M-FS-190  
A device, incorporating a collar with a hexagonal opening which fits snugly over a hexagonal nut used to engage instrument panel components, keeps the adjustment knob locked. A quick release mechanism frees the knob for rotational adjustment.
- B64-10272**  
VISCIOUS-PENDULUM DAMPER SUPPRESSES STRUCTURAL VIBRATIONS  
REED, W. H., III NOV. 1964  
LANGLEY-45  
The viscous pendulum damper consists of a cylinder containing round trays on which round lead slugs rest. When assembled, the container is filled with a viscous liquid and attached, with axis vertical, to the structure. The device permits varying the damping of structural vibrations.
- B64-10274**  
VEHICLE WALKS ON VARIED TERRAIN, CAN ASSIST HANDICAPPED PERSONS  
INNOVATOR NOT GIVEN NOV. 1964  
WOO-005  
A battery-powered motorized vehicle with three pairs of legs connected to push rods and a series of linkages is constructed for traversing varied terrains. Two cams connected to the drive mechanism control the motion of the legs. The basic design may be adapted for use with motorized wheelchairs.
- B64-10277**  
APPARATUS ALTERS POSITION OF OBJECTS TO FACILITATE DEMAGNETIZATION  
RINARD, G. WATSON, J. D. NOV. 1964  
GSFC-234  
An apparatus consisting of pulleys, a drive shaft and an inner compartment, in which components to be demagnetized are mounted, is constructed. Due

to the speed ratio of the three frames, every point on a component in the inner compartment is cycled through an optimum locus in the demagnetization field.

**B64-10278**  
SENSITIVE LOW-PRESSURE RELIEF VALVE HAS POSITIVE SEATING AGAINST LEAKAGE  
INNOVATOR NOT GIVEN /N. AM. AVIATION INC./ NOV. 1964  
W00-041

A pilot-operated relief valve which provides positive seating against leakage in cryogenic systems is described. The principal advantage is that the pilot poppet is unaffected by variations in control pressures in the pilot cavity, and results in a more accurate sensing of inlet pressure conditions.

**B64-10284**  
APPARATUS MEASURES VERY SMALL THRUSTS  
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ NOV. 1964  
W00-048

Measurement of very small thrusts of an ion engine are made by mounting the engine on a platform supported by leaf springs which are loaded to have a zero spring constant. Measuring apparatus includes an inductive sensor, servo amplifier, and a counterthrust feedback system.

**B64-10306**  
COMPRESSED GAS SYSTEM OPERATES SEMITRAILER BRAKES DURING WINCHING OPERATION  
TUPPER, W. E. DEC. 1964  
JPL-0036

To move van-type semi-trailers into and out of confined spaces, an auxiliary braking system is mounted on a standard dolly converter. Compressed nitrogen is used to actuate the brakes which are used in conjunction with a power winch.

**B64-10327**  
CONNECTOR SEALS FLUID LINES AT CRYOGENIC TEMPERATURES AND HIGH VACUUMS  
KITTS, W. T. PLATT, P. K. JAN. 1965  
GSFC-253

A connector that will serve as a seal for fluids at cryogenic temperatures and in high vacuums was constructed by installing a metal disk between two sets of mating serrations to form two sealing surfaces. Compression on both sealing surfaces is ensured by spring action of the disk.

**B64-10348**  
SAFETY RESTRAINER PREVENTS WHIPPING OF RUPTURED HIGH-PRESSURE HOSE  
THOMPSON, W. E. DEC. 1964  
LEWIS-99

The braid at each end of a standard electric cable puller is modified to reinforce high pressure, flexible, fluid transfer hoses. This safety device acts as a restraint if the line ruptures.

**B64-10406**  
POLYCHART CONTOUR ENABLES DATA EXTRAPOLATION FROM MULTIPLE PLOTTING CHARTS  
SWINDALL, P. M. WISE, T. E. JUL. 1964  
M-FS-37

A polychart contour plotter is used to reduce the data from all 19 antenna pattern charts to a one-chart form.

**B65-10003**  
ILLUMINATED DISPLAY PANEL IS EASILY CHANGED  
INNOVATOR NOT GIVEN /IBM/ JAN. 1965  
MSC-108

Photographic negative placed between two plastic sheets and back-lighted in selected areas prepares illuminated multicolored display panels. The device is inexpensive, easily changed, and quickly fabricated.

**B65-10007**  
THERMOCOMPRESSION BONDING PRODUCES EFFICIENT SURFACE-BARRIER DIODE  
INNOVATOR NOT GIVEN /IBM/ JAN. 1965  
JPL-SC-066

Thermocompression bonding of a gold wire to a

gallium-arsenide wafer produces a quality surface barrier diode with fast recovery times. The properties of this combination may be useful in semiconductor devices.

**B65-10008**  
SHOCK ABSORBER PROTECTS MOTIVE COMPONENTS AGAINST OVERLOADS  
INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ JAN. 1965  
W00-092

Shock absorber with an output shaft, hollow gear, and a pair of springs forming a resilient driving connection between shaft and gear, operates when abnormally high torques are applied. This simple durable frictional device is valuable in rotating mechanisms subject to sudden overloads.

**B65-10009**  
FORMING BLOCKS SPEED PRODUCTION OF STRAIN GAGE GRIDS  
BOWN, J. L. GARDNER, D. E. FEB. 1965  
LEWIS-182

A tool is designed which facilitates the forming of wire grids used in manufacturing strain gauge grids. Flattening the grid wire by a cold working process produces a stabilized grid which can be readily handled for storage or shipment.

**B65-10014**  
USE OF TEAR RING PERMITS REPAIR OF SEALED MODULE CIRCUITRY  
INNOVATOR NOT GIVEN /IBM/ JAN. 1965  
M-FS-210

Improved packaging technique for modulator electronic circuitry utilizes a tear ring which may be removed for repair and resealed. The tear ring is put over the container and header to which the electronic circuit assembly has been attached.

**B65-10017**  
EXPLOSIVES ACTUATE NONMAGNETIC INDEXING DEVICE  
BAUERNSCHUB, J. P., JR. JAN. 1965  
GSFC-237

Nonmagnetic explosive-actuated indexing device creates magnetic field that can be tolerated by a sensor.

**B65-10019**  
WIDE-ANGLE SENSOR MEASURES RADIANT HEAT ENERGY IN CORROSIVE ATMOSPHERES  
INNOVATOR NOT GIVEN /BOEING CO./ JAN. 1965 SEE ALSO B63-10004  
M-FS-228

Ellipsoidal cavity device measures radiant heat energy over wide incident angles in corrosive atmospheres. The instrument consists of a cavity in copper heat sink sealed with sapphire window to protect thermocouple.

**B65-10020**  
OPTICAL ARRANGEMENT INCREASES USEFUL LIGHT OUTPUT OF SEMICONDUCTOR DIODES  
INNOVATOR NOT GIVEN /IBM/ JAN. 1965 SEE ALSO B64-10297  
JPL-SC-064

Useful light output of semiconductor diodes increased by incorporating the diode in an integral reflector and lens assembly. This reduces normal reflection losses between the diode and the air.

**B65-10021**  
PICKUP DEVICE READS PRESSURES FROM PORTS IN ROTATING MECHANISMS  
JANAS, B. JAN. 1965 SEE ALSO B64-10031  
LEWIS-158

Indexing pickup monitors fluid pressures from ports at various angles on high or low speed rotating mechanisms in operation. By a simple axial movement of a takeoff connector, angle changing takes place. This device can be adapted for electric current monitoring.

**B65-10022**  
KNOB LINKAGE PERMITS ONE-HAND CONTROL OF SEVERAL OPERATIONS  
CODDING, G. C. LAVENDER, C. E. JAN. 1965  
MSC-30

05 MECHANICAL

- Electromechanical device with single knob provides one-hand control of numerous electrical or mechanical functions. The principle of this design may have application to remote-control switching devices.
- B65-10027**  
**FLUID-PRESSURE MEASUREMENT APPARATUS USES SHORT-LENGTH MANOMETER TUBES**  
 SATHER, B. I. MAR. 1965  
 LEWIS-28  
 System of short length U-tube manometers with a proportionally divided reference pressure measures high fluid pressures.
- B65-10029**  
**SEISMIC TRANSDUCER MEASURES SMALL HORIZONTAL DISPLACEMENTS**  
 GREENWOOD, T. L. MAR. 1965  
 M-FS-81  
 Pendular seismic transducer mounted on base plate measures small horizontal displacements of structures subjected to vibration where no fixed reference point is available. Enclosure of transducer in transparent plastic case prevents air currents from disturbing the pendulum balance.
- B65-10031**  
**SPRING LOADED BEADED CABLE MAKES EFFICIENT WIRE PULLER**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ FEB. 1965  
 1965  
 W00-108  
 An efficient wire puller consists of a steel probe with a hole in one end fastened to a steel cable which is strung with metal beads compressed by spring loaded ferrules. This device allows cables to be pulled or forced around bends and elbows in pipes or tubes.
- B65-10035**  
**OCEANBORNE TRANSPONDER PLATFORM HAS GOOD STABILITY**  
 INNOVATOR NOT GIVEN /IBM/ FEB. 1965  
 M-FS-171  
 Determination of space vehicle range and orbit is aided by a stable subsurface oceanic transponder. This device consists of a buoy held below the surface by a three-point system of anchors and mooring lines with an above surface antenna.
- B65-10037**  
**IMPROVED HOLDER PROTECTS CRYSTAL DURING HIGH ACCELERATION AND IMPACT**  
 LE VAY, K. H. FEB. 1965  
 JPL-463  
 A plastic holder, which retains a crystal blank with standard silvered contacts sandwiched between two copper contacts, protects the crystal against vibration during high acceleration and impact.
- B65-10038**  
**FASTENER PROVIDES COOLING AND COMPENSATES FOR THERMAL EXPANSION**  
 INNOVATOR NOT GIVEN /AEROJET-GEN. CORP./ FEB. 1965  
 1965  
 NU-0003  
 A fastener composed of a concentric bellows welded to two plates forming an annular cavity provides cooling and thermal expansion compensation in a high temperature environment.
- B65-10039**  
**NONRESONANT SUPPORT FACILITATES VIBRATION TESTING OF STRUCTURES**  
 INNOVATOR NOT GIVEN /BOEING CO./ FEB. 1965  
 M-FS-224  
 An essentially frictionless four-point support system which utilizes bearings and pistons and allows for determination of vibration frequencies of large structures. Retardation of vertical or horizontal motion is due to the viscous damping by the hydrostatic pressure of the oil or by adjustment of the gas volume in the accumulator.
- B65-10040**  
**VALVE DESIGNED WITH ELASTIC SEAT**  
 MAC GLASHAN, W. F., JR. FEB. 1965
- JPL-442**  
 Absolute valve closure is accomplished by a machined valve with an axially annular channel which changes the outlet passage into a thin tubular elastic seat member with a retainer backup ring. The elasticity of the seat provides tight conformity to ball irregularity.
- B65-10042**  
**FLEXURE SUPPORT SYSTEM PROTECTS THERMALLY AND DYNAMICALLY LOADED MODELS**  
 CRUMPLER, W. B. FEB. 1965  
 LANGLEY-39  
 The design of an eight legged flexure support system which permits differential thermal expansion of thin skinned models subjected to high temperatures is done by setting the length-wise axes of the supporting legs approximately normal to the line of absolute motion of the model supported.
- B65-10049**  
**SCREW LOCKING CUPS QUICKLY AND NEATLY CRIMPED**  
 INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ FEB. 1965  
 NU-0009  
 A tool consisting of a positioning pin which is engaged in the screw and depressed until the tool body contacts the locking cup permits quick and neat crimping.
- B65-10053**  
**SEAL ALLOWS BLIND ASSEMBLY AND THERMAL EXPANSION OF COMPONENTS**  
 INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ FEB. 1965  
 NU-0005  
 The design of a seal consisting of two concentric cylinders with outer and inner threaded elements attached to each side of the system interface withstands large temperature changes and allows for blind assembly.
- B65-10060**  
**NEW ALLOY BRAZES TITANIUM TO STAINLESS STEEL**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAR. 1965  
 1965  
 MSC-102  
 Brazing alloy of palladium, silver and silicon is used in brazing titanium to stainless steel without embrittling metals at the brazed interfaces.
- B65-10063**  
**CERAMIC-COATED BOAT IS CHEMICALLY INERT, PROVIDES GOOD HEAT TRANSFER**  
 SPITZER, C. R. MAR. 1965  
 LANGLEY-90  
 Refractory metal foil sprayed with ceramic coating serves as evaporating boat for inorganic materials. The high thermal conductivity of this boat makes it useful with ohmic heaters.
- B65-10064**  
**DEVICE MEASURES CURVED SURFACE FINISH ON GEAR TEETH**  
 INNOVATOR NOT GIVEN /GE/ MAR. 1965  
 W00-112  
 Measurement of the curved surface finish on gear teeth is made by a device used in conjunction with a conventional profilometer.
- B65-10070**  
**SIMPLE SCALE INTERPOLATOR FACILITATES READING OF GRAPHS**  
 FETTERMAN, D. E., JR. MAR. 1965  
 LANGLEY-88  
 Simple transparent overlay with interpolation scale facilitates accurate, rapid reading of graph coordinate points. This device can be used for enlarging drawings and locating points on perspective drawings.
- B65-10074**  
**NITROGEN DIOXIDE PRODUCED BY SELF-SUSTAINED PYROLYSIS OF NITROUS OXIDE**  
 SABOL, A. P. MAR. 1965  
 LANGLEY-32  
 Apparatus is developed for achieving continuous

self-sustaining pyrolysis reaction in the production of nitrogen dioxide from nitrous oxide. The process becomes self-sustaining because of the exothermic reaction and the regenerative heating of the gases in the pyrolysis chamber.

**B65-10075**  
TENSION IS SERVO CONTROLLED IN FILM ADVANCE SYSTEM  
INNOVATOR NOT GIVEN /AM. OPT. CO./ MAR. 1965  
LANGLEY-54

Servocontrol device feeds film into a roller system. Two linear potentiometers connected to spring loaded tension rollers furnish servo input signal. Can be used in any continuous material transport system.

**B65-10077**  
NEW COUPLING COMPENSATES FOR SHAFT MISALIGNMENT  
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ MAR. 1965  
NU-0013

Coupling of splined shafts with slight misalignment is accomplished by means of a crown spline and sleeve arrangement.

**B65-10078**  
FABRICATION METHOD PRODUCES HIGH-GRADE ALUMINA CRUCIBLES  
PALMOUR, H. MAR. 1965  
M-FS-216

Alumina-binder mixture, which has been dry pressed in a die using a mating punch, forms crucibles of various configurations and after firing results in a ceramic structure for use in diffusion experiments.

**B65-10090**  
COMPACT ASSEMBLY GENERATES PLASTIC FOAM, INFLATES FLOTATION BAG  
INNOVATOR NOT GIVEN APR. 1965  
LANGLEY-96

Device for generating plastic foam consists of an elastomeric bag and two containers with liquid resin and a liquid catalyst. When the walls of the containers are ruptured the liquids come into contact producing foam which inflates the elastomeric bag.

**B65-10094**  
CUTTER AND STRIPPER REDUCES COAXIAL CABLE CONNECTION TIME  
THOMPSON, F. E. APR. 1965  
ARC-40

Consisting of three pivoted members, this hand cutter and stripper positions to cut shielding and insulation at the right distance and depth. Coaxial cable is prepared quickly and accurately for connector attachment.

**B65-10098**  
CONTACT STRESSES CALCULATED FOR MINIATURE SLIP RINGS  
ALBRIGHT, F. G. DOMEREST, K. E. HORTON, J. C. APR. 1965  
M-FS-280

Using mathematical formulations to plot the graphs of the contact preload versus the Hertzian load, calculations of unit loading of the preloaded brushes on slip rings can be made. This optimizes the design of contact brushes and miniature slip rings.

**B65-10099**  
SLIT FEEDS REDUCE UNBALANCED TORQUES IN GAS-LUBRICATED BEARINGS  
BATSCH, F. F. LAUB, J. H. APR. 1965 SEE ALSO B63-10123 AND B64-10050  
JPL-264

Gas-lubricated journal bearing with narrow radial slits forming circular gas-feed passages regulates gas flow in precision instruments. Asymmetrical flow pattern and unbalanced torques are prevented.

**B65-10101**  
JIG AND FIXTURE AID FABRICATION OF TUNGSTEN RIVETS  
CHATTIN, J. H. APR. 1965

**LEWIS-185**

Jig and fixture that holds several lengths of tungsten rods produces rivets simply and inexpensively. The apparatus allows sufficient tungsten to be exposed for heating and forging into a rivet head.

**B65-10104**  
LEAF-SPRING SUSPENSION PROVIDES ACCURATE PARALLEL DISPLACEMENTS  
MC CREAMY, R. A. APR. 1965  
JPL-480

Leaf-spring suspension device with the springs symmetrically mounted on suspension frames provides accurate parallel displacements of loads over short linear distances.

**B65-10109**  
ROCK BIT REQUIRES NO FLUSHING MEDIUM TO MAINTAIN DRILLING SPEED  
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ APR. 1965

**JPL-W00-031**

Steel drill bit having terraces of teeth intersected by spiral grooves with teeth permits the boring of small holes through rock with low power. The cuttings are stored in a chamber behind the cutting head. Could be used as sampling device.

**B65-10110**  
MAGNETS POSITION X-RAY FILM FOR WELD INSPECTION  
WAGNER, R. P. APR. 1965  
M-FS-253

Film-positioning device uses magnets to hold X-ray film for weld inspection in nonferrous structures, such as tanks, where access to interior points is difficult.

**B65-10111**  
PROBE TESTS MICROWELD STRENGTH  
INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ APR. 1965  
W00-118

Probe is developed to test strength of soldered, brazed or microwelded joints. It consists of a spring which may be adjusted to the desired test pressure by means of a threaded probe head, and an indicator lamp. Device may be used for electronic equipment testing.

**B65-10113**  
SHOCK MOUNT ISOLATES PRESSURE TRANSDUCERS FROM VIBRATION  
ROGERO, R. S., JR. APR. 1965  
JPL-631

Pressure transducer is isolated from shock and vibration forces by a pressure-compensated shock mount. Silicone elastomer O-rings within the shock mount serve as shock and vibration-damping pads.

**B65-10114**  
AVERAGING PROBE REDUCES STATIC-PRESSURE SENSING ERRORS  
RITCHIE, V. S. APR. 1965  
LANGLEY-36

Averaging the high and low pressure admitted to a plenum through circumferentially spaced orifices provides a probe that accurately senses the free-stream static pressure on an aerodynamic surface. This surface does not have a preferred angle of inclination to the direction of the airstream cross flow.

**B65-10115**  
INERT GAS SPRAYING DEVICE AIDS IN REPAIR OF HAZARDOUS SYSTEMS  
TELEHA, S. APR. 1965  
LEWIS-8B

Inert gas spraying device aids in safely making mechanical repairs to a cryogenic fluid system without prior emptying of the system. This method can be applied to any natural or bottled gas system and with modifications to gasoline transports.

**05 MECHANICAL****B65-10116**

**LOW-COST TOOL MINIMIZES DAMAGE TO O-RINGS DURING INSTALLATION**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ APR. 1965  
 MSC-140

Tapered cylindrical tool enables O-ring installation over threaded fasteners without seal damage.

**B65-10121**

**FLOW CONTROL VALVE IS INDEPENDENT OF PRESSURE DROP**  
 INNOVATOR NOT GIVEN /THIOLKOL CHEM. CORP./ APR. 1965  
 JPL-WOO-039

Remote control of fluid flow in a low-power system is established by a flow control valve with a flapper and nozzle flow control. Constant rates are maintained despite fluctuating pressure across the valve.

**B65-10126**

**COLLAPSIBLE TRUSS STRUCTURE IS AUTOMATICALLY EXPANDABLE**  
 INNOVATOR NOT GIVEN /GE/ MAY 1965  
 GSFC-265

Coil springs wound with maximum initial tension in a three-truss, closed loop structure form a collapsible truss structure. The truss automatically expands and provides excellent rigidity and close dimensional tolerance when expanded.

**B65-10130**

**COLLAR POSITIONS STRIP STOCK USED TO FORM COIL ON MANDREL**  
 BLAZE, C. J. MAY 1965  
 JPL-198

Guide collar fastened to a mandrel helps form a coil of strip sheet metal stock. The collar maintains the strip stock in its proper position during winding of each turn of the coil.

**B65-10131**

**APPARATUS FACILITATES PRESSURE-TESTING OF METAL TUBING**  
 GYORGAK, C. A. MAY 1965  
 LEWIS-174

Burst-testing of refractory metal tubing is conducted in an apparatus in which tubular specimens are firmly gripped and test pressures and temperatures are applied. Porosity, flaw, and fatigue-stress rupture are also tested.

**B65-10134**

**HIGH PERMEABILITY SEMICONDUCTORS PERMIT CLOSE-TOLERANCE SOLDERING**  
 INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ MAY 1965  
 GSFC-319

High permeability semiconductors concentrate magnetic field energy in small areas to allow soldering of small components. This device can be used in microminiature parts in thin-film fabrication.

**B65-10135**

**COILED SPRING MAKES SELF-LOCKING DEVICE FOR THREADED FASTENERS**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAY 1965  
 MSC-149

Coiled spring device provides both easy self-locking and disassembly for screw-threaded fasteners. When the fastener turns in one direction the spring grips one of the fastener threads and releases when the fastener turns in the opposite direction.

**B65-10141**

**INTEGRAL RIBS FORMED IN METAL PANELS BY COLD-PRESS EXTRUSION**  
 BRADIE, P. R. SCHUERER, P. H. MAY 1965  
 M-FS-230

Metal panels with integral ribs are formed by the cold-press extrusion method without material loss. Integral ribs in aluminum-alloy panels are formed by this process.

**B65-10144**

**LIGHTWEIGHT LOAD SUPPORT SERVES AS VIBRATION DAMPER**  
 LAYMAN, W. E. MAY 1965  
 JPL-661

Omnidirectional antennas and solar panels can be supported by a thin-walled tubular strut. Silicon grease is used as the vibration-damping medium and a coil spring supports static loads.

**B65-10147**

**IMPROVED FLUID CONTROL VALVE EXTENDS DIAPHRAGM LIFE**  
 MAC GLASHAN, W. F. MAY 1965  
 JPL-345

Wear resistance of flexible diaphragms in fluid control valves is increased by incorporating a soft rubber washer at the bottom of the piston, a flexible buffer between the diaphragm and the valve seat, and a fluid feedback arrangement. The stress and wear of components at the valve seat are minimized.

**B65-10148**

**BIDIRECTIONAL TORQUE FILTER ELIMINATES BACKLASH**  
 BAKER, R. VEILLETTE, L. WILLIAMS, S. MAY 1965  
 GSFC-335

Two elastic springs connecting a hub and two spur gears absorb bidirectional step torque differentials and provide antibacklash characteristics between input and output shafts. This device is used in precise control systems.

**B65-10149**

**CANTILEVER SPRINGS MAINTAIN TENSION IN THERMALLY EXPANDED WIRES**  
 TERSELIC, R. A. MAY 1965  
 LEWIS-136

Two deflected cantilever springs strung with wire provide force displacement compensation to maintain tension in the wires as they undergo thermal expansion. This method of maintaining tension in thermally expanded wires is used in electric space heaters and residential heat exchangers.

**B65-10150**

**METAL BELLOWS CUSTOM-FABRICATED FROM TUBING**  
 INNOVATOR NOT GIVEN MAY. 1965  
 LEWIS-192

Mandrel assembly mounted in a lathe chuck is used with a forming wheel to roll-form bellows from standard sheet metal tubing. Spacers and mandrels of various sizes custom-fabricate bellows of any desired dimensions.

**B65-10153**

**TITANIUM TREATMENT IMPROVES BRAZED JOINTS**  
 INNOVATOR NOT GIVEN /MIT/ MAY 1965  
 MSC-127

Pretreating metal with a thin coating of pure titanium improves the wettability and flow of brazing alloys. This can be used in the manufacturing of aviation and aerospace components where high strength-to-weight ratio must be achieved.

**B65-10154**

**SYSTEM MEASURES UNIDIRECTIONAL FORCES, EXCLUDES EXTRANEEOUS FORCES**  
 BEHRENDT, D. R. HEGLAND, D. E. MAY 1965  
 LEWIS-170

System measures unidirectional force without interference from other directional forces. The measuring apparatus is mounted so that it only moves vertically and is constrained from horizontal and rotational movement. This system can be used to accurately measure small forces in one direction, or as an analytic balance.

**B65-10160**

**LOW-COST SEAL COMPENSATES FOR SURFACE IRREGULARITIES**  
 INNOVATOR NOT GIVEN /AEROJET-GEN. CORP./ JUN. 1965  
 NU-0016

Seal assembly consisting of a steel V-ring and a perforated tubular fluorocarbon polymer O-ring provides a barrier to gaseous and liquid hydrogen under high pressure.

**B65-10163**  
**DEVICE DISCONNECTS SEVERAL COUPLINGS**  
**SIMULTANEOUSLY**  
 KORSYTHE, A. K. JUN. 1965  
 JPL-226

Actuator assembly disconnects electric cable and fluid-line coupling from a rocket. The disconnecter incorporates interconnected hydraulic cylinders which effect an equal and simultaneous displacement of pistons upon admission of compressed air through a solenoid control valve.

**B65-10166**  
**SPLICE PLATE DESIGN ASSURES STRUCTURAL**  
**SEPARATION BY MILD EXPLOSIVE**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965  
 1965  
 MSC-137

Splice plate with mechanical joint is separated by expanding gases of a mild detonating fuse. The gas pressures of the low-yield explosive eliminate component fragmentation and achieve excellent control of the separation line.

**B65-10168**  
**LATHE ATTACHMENT USED TO MACHINE ELLIPTICAL**  
**CONES**  
 ALLEN, J. H., SR. WOBIG, O. A. JUN. 1965  
 MSC-100

Close-tolerance elliptical cones are fabricated by cutting-tool guide assembly used with conventional tracer cartridge on turret lathe accurately produced in two machine operations

**B65-10170**  
**METAL PARTS HYDROSIZED BY EXPLOSIVE FORCE**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965  
 1965  
 M-FS-289

Large metal parts are sized by a charge exploded above a sealed container filled with evacuated die and water. Explosive hydrosizing achieves close dimensional tolerances, eliminates damage to the surface, and allows longer force application and more even pressure distribution.

**B65-10174**  
**PRESSURE TRANSDUCER SYSTEM IS FORCE-BALANCED,**  
**HAS DIGITAL OUTPUT**  
 INNOVATOR NOT GIVEN /GIANNINI CONTROLS CORP./  
 JUN. 1965  
 M-FS-154

Forced-balanced pressure transducer and associated circuitry controls pressure testing of space equipment systems under actual operating conditions. The transducer and circuitry automatically converts the sensed pressure to digital form.

**B65-10176**  
**DEVICE ENABLES MEASUREMENT OF MOMENTS OF**  
**INERTIA ABOUT THREE AXES**  
 CONN, J. JUN. 1965  
 GSFC-49

Device measures moments of inertia of an irregularly shaped mass about three mutually perpendicular axes by the standard pendulum and torque methods. A fixture suspends the test mass at one point and can be adjusted to allow oscillation of the mass.

**B65-10177**  
**EPOXY-RESIN PATTERNS SPEED SHELL-MOLDING OF**  
**ALUMINUM PARTS**  
 INNOVATOR NOT GIVEN /ALABAMA UNIV./ JUN. 1965  
 M-FS-303

Half patterns cast from commercial epoxy resin containing aluminum powder are used for shell-molding of aluminum parts. The half patterns are cast in plastic molds of the original wooden pattern. Ten serviceable sand-resin molds are made from each epoxy pattern.

**B65-10180**  
**NEW NUT AND SLEEVE IMPROVE FLARED CONNECTIONS**  
 GARRARD, J. S. JUN. 1965  
 M-FS-194

Improved nut and sleeve of standard stainless steel flared tube connection allows forces on the

mating surfaces to be uniformly applied. This can be applied to pressurized fluid systems such as refrigeration, air conditioning, and hydraulic systems.

**B65-10181**  
**HAND TOOL BENDS COMPONENT LEADS ACCURATELY**  
 INNOVATOR NOT GIVEN /CHRYSLER CORP./ JUN. 1965  
 M-FS-308

Hand-operated die set bends, without damage, electrical component leads to perfectly match holes in printed circuit board. This tool speeds up printed circuit fabrication and reduces the number of component rejections.

**B65-10185**  
**DISPENSING SYSTEM ELIMINATES TORSION IN**  
**DEPLOYED HOSES**  
 INNOVATOR NOT GIVEN /IIT RES. INST./ JUN. 1965  
 MSC-80

Dispensing system uses a rotating drum, transfer arm, and stationary drum to deploy, reel in, and store an attached hose. This system which eliminates torsion and minimizes strain and wear of flexible hoses, is used for handling flexible cables that have one end permanently attached to an outlet or connector.

**B65-10191**  
**EXTENDIBLE COLUMN CAN BE STOWED ON DRUM**  
 HOLTZ, G. M. HOWARD, E. A. JUN. 1965  
 JPL-686

Column formed from a series of segments held together by an internal spring or cable can be coiled on a drum or extended into a rigid structure. This storable coil is useful in boring for soil samples and supporting electrical and optical sensors.

**B65-10192**  
**SPIRAL HEATER COILS HAND-FORMED WITH FIXTURE**  
 CHATTIN, J. H. JUN. 1965  
 LEWIS-208

Bench model jig and fixture used for hand fabricating spiral coils of various lengths from flat strip stock. This tool is used to make springs and coils to custom lengths.

**B65-10198**  
**SELF-ALIGNING FIXTURE USED IN LATHE CHUCK JAW**  
**REFACING**  
 LINN, C. C. JUN. 1965  
 FRC-21

Self-aligning tool positions and rigidly holds lathe chuck jaws for refacing and truing of the clamping surface. The jaws clamp the fixture in the manner of clamping a workpiece. The fixture can be modified to accommodate four-jawed checks.

**B65-10201**  
**ELECTRICAL CABLE CONNECTOR-CLAMP HAS SMOOTH**  
**EXTERIOR SURFACE**  
 INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965  
 1965  
 MSC-154

Electrical cable connector-clamp fitted with a collet has a smooth exterior surface that can be easily gripped. The collet clamps a portion of the cable and provides for connecting it to a standard electrical connector.

**B65-10205**  
**BALL-AND SOCKET JOINTS PROVIDE ACCURATE**  
**BIAXIAL GIMBAL**  
 ROUZE, E. R. JUL. 1965  
 JPL-658

Ball-and-socket joints are used to connect two rotating inputs to orthogonally pivoted outputs. This provides an accurate biaxial gimbal which will operate in continuous motion without backlash.

**B65-10207**  
**FLUID CHECK VALVE HAS FAIL-SAFE FEATURE**  
 GAUL, L. C. JUL. 1965  
 JPL-0019

Check valve ensures unidirectional fluid flow and,

05 MECHANICAL

in case of failure, vents the downstream fluid to the atmosphere and gives a positive indication of malfunction. This dual valve consists of a master check valve and a fail-safe valve.

**B65-10210**  
**FIBERGLASS DIES SPEED FORMING OF LARGE METAL SHEETS**  
 BROWN, R. L. SCHUERER, P. JUL. 1965  
 M-FS-214

Fiberglass tooling dies accelerate forming of large metal sheets. The dies, fabricated to fit over and fasten to the die bases, are lightweight, quickly replaced and have nongalling surfaces.

**B65-10216**  
**WIRE MESH ISOLATOR PROTECTS SENSITIVE ELECTRONIC COMPONENTS**  
 KERLEY, J. J., JR. JUL. 1965  
 GSFC-347

Sensitive electronic components are enclosed in wire mesh for protection. The wire mesh isolates the component from shock and vibration. It acts as a heat sink and as a screen against rf interference.

**B65-10219**  
**FLEXIBLE MAGNETIC PLANNING BOARDS ARE EASILY TRANSPORTED**  
 INNOVATOR NOT GIVEN /GEN. DYN./ASTRONAUTICS/ AUG. 1965  
 M-FS-340

Easily transportable preprinted magnetic planning boards are made by coating thin sheet steel with clear plastic. Flexible magnetic boards used with paper charts are constructed from close mesh steel screen.

**B65-10222**  
**INEXPENSIVE CHECK VALVE IS INSTALLED IN STANDARD AN FITTINGS**  
 MARTINEZ, J. S. AUG. 1965  
 JPL-2A

Check valve with a cylindrical flanged tube body is used in standard AN fittings. The valve also has an easily removable spring-loaded piston.

**B65-10227**  
**DIAPHRAGM ELIMINATES LEAKAGE IN CRYOGENIC FLUID DUCT COUPLING**  
 INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ AUG. 1965  
 WDD-142

Duct coupling with nickel steel diaphragm of low thermal expansivity is leakproof when used with cryogenic fluids. The diaphragm, located between the two flanges of the coupling, reduces axial shrinkage at the coupling flanges to a minimum.

**B65-10229**  
**SCOOP ATTACHMENT MAKES HELICOPTER RECOVERIES EASIER AND SAFER**  
 KOONS, W. E. AUG. 1965  
 MSC-130

Helicopter with rigid boom and net attachment performs rescue or recovery operations easily and safely. The attachment in the front of the helicopter scoops objects from difficult and otherwise inaccessible areas and pivots to the side hatch of the aircraft so that no crew member need leave the craft.

**B65-10230**  
**HYDRAULIC DEVICE PROVIDES ACCURATE DISPLACEMENTS TO MICROINCHES**  
 TSUTSUMI, K. /MIT/ AUG. 1965  
 MSC-112

Hydraulic drive device translates microinch deviation measurements into precise corrective displacements. The unit is driven by a servomotor activated by the output of an attitude sensing device.

**B65-10231**  
**HANDTOOL FACILITATES EXTRACTION OF CIRCUIT MODULES**  
 LUSBY, T. K., JR. AUG. 1965  
 LANGLEY-38

Compact handtool extracts electronic modules from

circuit board socket. It is used on modules that have four small notches in the base of the plastic housing.

**B65-10235**  
**ANGULAR GLASS TUBING DRAWN FROM ROUND TUBING INNOVATOR NOT GIVEN /DEBELL AND RICHARDSON/ AUG. 1965**  
 HQ-20

Round glass tubing softened in a furnace is drawn over a shaped plug or mandrel to form shapes with other than a circular cross section. Irregularly shaped tubing is formed without limitations on tube length or wall thickness.

**B65-10236**  
**BURST DIAPHRAGM PROTECTS VACUUM VESSEL FROM INTERNAL PRESSURE TRANSIENTS**  
 HOTZ, G. M. HOWARD, E. A. AUG. 1965  
 JPL-687

Supported dual-mode burst diaphragm protects vacuum vessels from transient internal pressures. It forms the interface between the vacuum in the vessel and an external pressure.

**B65-10241**  
**SHOCK ABSORBER OPERATES OVER WIDE RANGE**  
 CREASY, W. K. JONES, J. C. AUG. 1965  
 MSC-168

Piston-type hydraulic shock absorber, with a metered damping system, operates over a wide range of kinetic energy loading rates. It is used for absorbing shock and vibration on mounted machinery and heavy earth-moving equipment.

**B65-10245**  
**CAPTIVE NUT FASTENER SECURELY JOINS BRITTLE MATERIALS**  
 SACCOCIO, R. M. /WESTINGHOUSE ELEC. CORP./ AUG. 1965  
 NU-0008

Extension tube captive nut with a standard bolt joins assemblies with an inaccessible nut location. This fastener is excellent for joining brittle materials.

**B65-10246**  
**THERMOCOUPLE-TO-INSTRUMENTATION CONNECTOR FEATURES QUICK ASSEMBLY**  
 HENSHAW, E. /WESTINGHOUSE ELEC. CORP./ AUG. 1965  
 NU-0022

Rigid thermocouple leads are connected to flexible instrumentation leads by a crimping and bridging process. This method eliminates the need for expensive transition sections and can be accomplished in about five minutes.

**B65-10248**  
**SYSTEM TRANSMITS MECHANICAL VIBRATION INTO HAZARDOUS ENVIRONMENT**  
 ARMSTRONG, D. G. /WESTINGHOUSE ELEC. CO./ GAAL, A. E. AUG. 1965  
 NU-0025

Vibration transducers are tested in a hazardous environment using a single axis transmission system with an electromagnetic shaker table and vibrating wires which drive identical rocker arms, one in the test cell and the other outside. This system can be modified for a multiaxis configuration.

**B65-10251**  
**CONTROL OF COMPONENT DIFFERENTIAL HARDNESS INCREASES BEARING LIFE**  
 ANDERSON, W. J. PARKER, R. J. ZARETSKY, E. V. AUG. 1965  
 LEWIS-190

Bearing fatigue life is maximized when the bearing ball or roller hardness is between one and two points greater than that of the bearing race as measured on the Rockwell C scale.

**B65-10254**  
**REMOTEY OPERATED CLAMPING TOOL HAS POSITIVE GRIP**  
 ADUCCI, S. A. SEWALD, A. W. /WESTINGHOUSE ELEC. CORP./  
 NU-0020

Jaw-type clamping tool inserts or removes objects

in a hazardous environment. It has a strong, positive gripping force which is remotely operated by means of a wedge-screw mechanism.

**B65-10256**  
HOLLOW PLASTIC HOOPS PROTECT THERMOCOUPLE  
IN STORAGE AND HANDLING  
OSMOND, L. H. /WESTINGHOUSE ELEC. CORP./ AUG.  
1965  
NU-0023

Thermocouples are shipped and stored in hollow plastic hoops. The hoop is an inexpensive but efficient method of protection.

**B65-10262**  
ROTATING HOLDER PERMITS ACCURATE GRINDING OF  
METALLURGICAL MICROSAMPLES  
CRAMER, D. L. SEP. 1965  
LEWIS-131

Metallurgical microsamples are held in a fixture which rotates the sample across a rotating grinding wheel. The dual rotation results in a level, flat surface on the sample.

**B65-10266**  
ONE-SHOT VALVE MAY BE REMOTELY ACTUATED  
KAMI, S. /HUGHES AIRCRAFT CO./ SEP. 1965  
WOO-195

One-shot valve, with spring-loaded plunger and sealing diaphragm, incorporates an emergency release actuated by a remote sensor. The plunger is released by the electrical melting of a fuse link and pierces the valve seal. The valve lowers fluid pressure in a container without losing the contained fluid.

**B65-10285**  
DIFFERENTIAL PRESSURE GAUGE HAS FAST RESPONSE  
WEBER, H. S. /ARMOUR RES. FOUND./ SEP. 1965  
M-FS-358

Differential pressure gauge with semiconductor-type strain gauge elements measures rapidly changing pressure. Output of the strain gauge elements is a dc voltage that is directly proportional to the pressure difference being measured.

**B65-10312**  
AIR BRAKE-DYNAMOMETER ACCURATELY MEASURES  
TORQUE  
INNOVATOR NOT GIVEN OCT. 1965  
LEWIS-163

Air brake-dynamometer assembly combines the principles of the air turbine and the air pump to apply braking torque. The assembly absorbs and measures power outputs of rotating machinery over a wide range of shaft speeds. It can also be used as an air turbine.

**B65-10319**  
REFRACTORY METALS WELDED OR BRAZED WITH  
TUNGSTEN INERT GAS EQUIPMENT  
WISNER, J. P. OCT. 1965  
LEWIS-219

Appropriate brazing metals and temperatures facilitate the welding or brazing of base metals with tungsten inert gas equipment. The highest quality bond is obtained when TIG welding is performed in an inert atmosphere.

**B65-10323**  
VOLUMETRIC SYSTEM CALIBRATES METERS FOR LARGE  
FLOW RATES  
INNOVATOR NOT GIVEN /N. AM. AVIATION/ NOV. 1965  
WOO-130

Volumetric system calibrates meters used for large liquid flow rates. The system employs trip probes and equipment to time the flow of liquid from a tare vessel into a calibrated vessel. This calibration system is used in the petroleum and chemical industries.

**B65-10326**  
ROUGH SURFACE IMPROVES STABILITY OF AIR-  
SOUNDING BALLOONS  
SCOGGINS, J. R. NOV. 1965  
M-FS-320

Aerodynamic stability of balloons used for measuring the intensity and direction of

atmospheric winds at various elevations is improved by incorporating a rough surface on the balloons. The rough-surfaced balloon is useful for collecting wind profiles and other meteorological data.

**B65-10327**  
PRESSURE RESPONSIVE SEAL HANDLES STATIC AND  
DYNAMIC LOADS  
MARSH, H. W. /N. AM. AVIATION/ NOV. 1965  
GSFC-441

Ported ball valves are sealed under both static and dynamic load conditions by a line-pressure responsive double-acting seal. The top of the seal engages the ported ball at the outer circumferential edge of the seal upper end, and the bottom of the seal seats on a flat circular lead with a continuous wall.

**B65-10338**  
INERT-GAS WELDING AND BRAZING ENCLOSURE  
FABRICATED FROM SHEET PLASTIC  
WISNER, J. P. NOV. 1965  
LEWIS-220

Custom-fabricated plastic bag maintains an inert-gas atmosphere for welding and brazing certain metals. The bag fits over part of the workpieces and the welding and brazing tools. It is also used for metal brazing and fusion plating which require an inert-gas atmosphere.

**B65-10339**  
DISK CALCULATOR INDICATES LEGIBLE LETTERING  
SIZE FOR SLIDE PROJECTION  
HULTBERG, R. R. NOV. 1965  
GSFC-409

Hand-operated disk calculator indicates the minimum size of letters and numbers in relation to the width and height of a working drawing. The lettering is legible when a slide of the drawing is projected.

**B65-10342**  
ELECTROMAGNETIC HAMMER REMOVES WELD  
DISTORTIONS FROM ALUMINUM TANKS  
SCHWINGHAMER, R. J. NOV. 1965  
M-FS-287

Distortions around weld areas on sheet-aluminum tanks and other structures are removed with a portable electromagnetic hammer. The hammer incorporates a coil that generates a controlled high-energy pulsed magnetic field over localized areas on the metal surface.

**B65-10346**  
IMPROVED POPPET VALVE PROVIDES POSITIVE  
DAMAGEPROOF SEAL  
WALLACE, E. D. NOV. 1965  
M-FS-293

Soft-seat poppet valve provides positive closure against fluid without damage to the seating surface on repeated cycling. It incorporates two compressible soft rings and a retaining ring of hard metal. Sealing is effected when the poppet seat is forced into intimate contact with a mating surface on one of the soft rings.

**B65-10348**  
STANDOFF TOOL SPEEDS PLACEMENT OF FRICTION-FIT  
ELECTRICAL TERMINALS  
MOORE, D. J. SKIFSTROM, W. W. /SPACE TECHNOL.  
LABS./ NOV. 1965  
WOO-029

Hand operated tool inserts terminals through compartment walls in electronic equipment. The tool is in the configuration of a modified pair of pliers with jaws consisting of a split chuck and anvil.

**B65-10351**  
HYDRAULIC DRIVE SYSTEM PREVENTS BACKLASH  
ACORD, J. D. NOV. 1965  
JPL-371

Hydraulic drive system uses a second drive motor operating at reduced torque. This exerts a relative braking action which eliminates the normal gear train backlash that is intolerable when driving certain heavy loads.

B65-10358

FASTENER DISTRIBUTES STRESS EVENLY FROM SANDWICH-PANEL-HUNG ITEMS  
SHAPIRO, J. /N. AM. AVIATION/ NOV. 1965  
MSC-236

Items are attached externally to cellular-core sandwich panels by a fastener anchored in the panel by a constant amount of adhesive. The changes caused to the core cells and skin sheets are minimized.

B65-10360

PORTABLE TOOL REMOVES BURRS FROM PIPE AND TUBING  
HEADLEY, C. A. PADILLA, V. E. SCHOPPMAN, R. A. /MCDONNELL AIRCRAFT CORP./ NOV. 1965  
MSC-237

Portable tool cleanly removes burrs that remain on tubing when it is cut. It restores the cut end to its original configuration, and carries away all chips and pieces. This tool is used in places of limited access where a larger tool could not be used

B65-10367

FLEXIBLE PLASTIC RING ASSEMBLY MAKES DURABLE SHAFT SEAL  
INNOVATOR NOT GIVEN /N. AM. AVIATION/ DEC. 1965  
WOO-227

Stacked flexible rings interleaved with solid metal rings of smaller width provide a durable seal ring for rotating shafts used in vacuum or pressure pumps.

B65-10370

BRAZING METHOD PRODUCES SOLID-SOLUTION BOND BETWEEN REFRACTORY METALS  
INNOVATOR NOT GIVEN /AVCO CORP./ DEC. 1965  
LEWIS-212

Brazing two refractory metals by diffusion bonding minimizes distortion and avoids excessive grain growth in the metals. This method requires the selection of an interface metal that forms intermediate low-melting eutectics or solid solutions with the metals to be brazed.

B65-10371

UNIVERSAL BELLOWS JOINT RESTRAINT PERMITS ANGULAR AND OFFSET MOVEMENT  
KUHN, R. F., JR. /N. AM. AVIATION/ DEC. 1965  
WOO-102

Universal joint-type restraint that employs ball joints permits maximum angular and lateral- offset movement in a bellows joint without danger of rupture or pressure drop in the line. It is used in high pressure and high- temperature applications in refineries, steam plants, or stationary power plants.

B65-10375

PORTABLE TOOL CLEANS PIPES AND TUBING  
HEADLEY, C. A. HEADLEY, R. JONES, D. D. /MCDONNELL AIRCRAFT CORP./ DEC. 1965  
MSC-238

Portable tool cleans and polishes the external surfaces of tubes and pipes without contaminating the interior areas with loose particles. The tool is driven by an electric drill and is connected to a vacuum source that removes debris resulting from the cleaning and polishing action.

B65-10378

REINFORCEMENT CORE FACILITATES O-RING INSTALLATION  
INNOVATOR NOT GIVEN /N. AM. AVIATION/ DEC. 1965  
WOO-228

Reinforcement core holds O-ring in place within a structure while adjacent parts are being assembled. The core in the O-ring adds circumferential rigidity to the O-ring material. This inner core does not appreciably affect the sectional elasticity or gland-sealing characteristics of the o-ring.

B65-10383

THREADED SPLIT RING CONNECTOR SEPARATES STRUCTURAL SECTIONS  
MAYO, J. W. JUL. 1965  
LANGLEY-145

Threaded split ring connector quickly and cleanly separates two structural members by remote control. The connector is retained in an expanded position by spring plates that are deflected and held by an explosive bolt. Ignition of the bolt effects the separation. This conceptual approach lends itself to various configurations and sizes of structures.

B65-10385

HAERTHER, L. W. ZIMMERMAN, P. A. /COLLINS RADIO CO./ DEC. 1965  
MSC-244

Rack mounted chassis units are quickly inserted or extracted by a device which is driven in either direction by turning a simple hand crank. This device is used in aircraft and water craft.

B65-10386

DRILL BIT DESIGN ASSURES CLEAN HOLES IN LAMINATED MATERIALS  
TILLOTSON, R. N. /DOUGLAS AIRCRAFT CO./ DEC. 1965  
WOO-098

Drill bit eliminates delamination when drilling laminated material. It cuts or shaves the material as it progresses through it. The bit acts to hold down the material during drilling to prevent tearing or ripping and produces a clean, smooth and defect-free hole. It prevents chipping in stretched plastic windows for high-altitude, high-performance aircraft.

B65-10388

STRAINER FITS INSIDE FLARED-TUBE FITTINGS  
PARKER, G. J. DEC. 1965  
LANGLEY-180

Cylindrical wire-mesh strainer which fits inside flare-tube fittings is readily installed and easily replaced. It has a collar that seats on the tapered shoulder of the male fitting.

B65-10391

TUNGSTEN WIRE AND TUBING JOINED BY NICKEL BRAZING  
INNOVATOR NOT GIVEN /AUTO-CONTROLS LABS./ DEC. 1965  
M-FS-394

Thin tungsten wire and tungsten tubing are brazed together using a contacting coil of nickel wire heated to its melting point in an inert-gas atmosphere. This method is also effective for brazing tungsten to tungsten-rhenium parts.

B65-10393

DIE AND TELESCOPING PUNCH FORM CONVOLUTIONS IN THIN DIAPHRAGM  
INNOVATOR NOT GIVEN /HONEYWELL/ DEC. 1965  
JPL-SC-135

Die and punch set forms convolutions in thin dished metal diaphragm without stretching the metal too thin at sharp curvatures. The die corresponds to the metal shape to be formed, and the punch consists of elements that progressively slide against one another under the restraint of a compressed-air cushion to mate with the die.

B65-10394

CENTRIFUGAL DEVICE SEPARATES LIQUID FROM GAS  
HANDLEWICH, R. M. STROUP, K. E. /UNITED AIRCRAFT CORP./ DEC. 1965  
MSC-282

Liquid-to-gas ratio is reduced from maximum efficiency of jet engine fuel by a centrifugal separator. The amount of liquid removed from the fuel is controlled by the separator-screen mesh size and its rotational speed.

B65-10401

PHOTOSENSORS USED TO MAINTAIN WELDING ELECTRODE-TO-JOINT ALIGNMENT  
BOWEN, J. B. /N. AM. AVIATION/ DEC. 1965  
MSC-243

Photosensors maintain electrode-to-joint alignment in automatic precision arc welding. They detect the presence and relative position of a joint to be welded and actuate a servomechanism to guide the welding head accordingly thus permitting alignment for more than straight line or true

circle joints.

B65-10402  
LIGHTWEIGHT DOOR SEALS CRYOGENIC CONTAINER  
AGAINST DIAPHRAGM TYPE LOADING  
ENGLEHART, R. C., JR. /N. AM. AVIATION/ DEC.  
1965  
M-FS-476

Lightweight, removable, sealed joint access door for a spherical or semispherical pressure vessel containing cryogenic materials uses a joint overlock design to take the shear and moment loads. Oversize bolt holes are used so that the attaching bolts are in tension only.

# SUBJECT INDEX

Cumulative Index to Tech Briefs

Issue 3

## Subject Index

The title of each Tech Brief is listed under several selected subject headings to provide the user with a variety of approaches in his search for specific information. The Tech Brief number, e.g. B65-10148, is located under and to the right of the title and is followed by a two-digit number, e.g. 05, which designates the subject category in which the entire entry can be found.

### A

<b>ABSORBER</b>			
Kinetic-energy absorber employs frictional force between mating cylinders			
LEWIS-75	B63-10442	05	
<b>ABSORPTION</b>			
Bidirectional torque filter eliminates backlash			
GSFC-335	B65-10148	05	
Removable well in reaction flask facilitates carbon dioxide collection			
ARC-47	B65-10316	03	
<b>ACCELERATION</b>			
Low-cost tape system measures velocity of acceleration			
GSFC-85	B63-10512	01	
<b>ACCELEROMETER</b>			
Crystal measures short-term, large-magnitude forces			
JPL-77	B65-10187	01	
Simple device produces accelerometer calibration pulse			
M-FS-363	B65-10269	01	
Miniature servo accelerometer is force-balanced			
JPL-155	B65-10340	01	
<b>ACCUMULATOR</b>			
High-pressure regulating system prevents pressure surges			
JPL-231	B63-10170	05	
Nonresonant support facilitates vibration testing of structures			
M-FS-224	B65-10039	05	
<b>ACETYLENE</b>			
Miniature oxygen-hydrogen cutting torch constructed from hypodermic needle			
JPL-545	B63-10517	05	
<b>ACOUSTIC GENERATOR</b>			
Device detects unbonded areas in plastic laminates			
WDD-206	B65-10380	01	
<b>ACTUATOR</b>			
Stepping switch with simple actuator provides many contacts in small space			
JPL-122	B63-10118	01	
Three-position rocker switch actuator has positive centering			
MSC-261	B65-10376	01	
<b>ADDITIVE</b>			
Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application			
LANGLEY-6A	B63-10318	03	
<b>ADHESIVE</b>			
Screening technique makes reliable bond at room temperature			
M-FS-227	B65-10004	03	
Improved conductive paste secures biomedical electrodes			
MSC-107	B65-10015	03	
Adhesive for vacuum environments resists shock and vibration			
MSC-56	B65-10016	03	
Peel resistance of adhesive bonds accurately measured			
GSFC-320	B65-10173	03	
Electronic modules easily separated from heat sink			
MSC-142	B65-10186	02	
Fastener distributes stress evenly from sandwich-panel-hung items			
MSC-236	B65-10358	05	
Adhesive-backed terminal board eliminates mounting screws			
MSC-173	B65-10396	01	
<b>AERODYNAMICS</b>			
Averaging probe reduces static-pressure sensing errors			
LANGLEY-36	B65-10114	05	
<b>AIR</b>			
Rapid helium-air analyzer can measure other binary gas mixtures			
LANGLEY-16	B63-10557	03	
Device induces lungs to maintain known constant pressure			
MSC-50	B64-10108	04	
Pneumatic power is transmitted through air bearing			
MSC-8	B64-10141	05	
Thermistor connector assembly increases accuracy of measurements			
LANGLEY-62	B65-10045	01	
Averaging probe reduces static-pressure sensing errors			
LANGLEY-36	B65-10114	05	
<b>AIR CONDITIONING</b>			
New nut and sleeve improve flared connections			
M-FS-194	B65-10180	05	



SUBJECT INDEX

Digital logic elements provide additional functions from analog input MSC-64	B64-10064	01	Multiaxial analyzer detects low-energy electrons GSFC-329	B65-10213	01
Improved insertion-loss tester JPL-358	B64-10080	01	<b>ANEMOMETER</b> New anemometer has fast response, measures dynamic pressure directly LANGLEY-28	B63-10530	05
Field-effect transistor improves electrometer amplifier ARC-36	B64-10143	01	<b>ANESTHESIOLOGY</b> Test monkeys anesthetized by routine procedure HQ-18	B65-10332	04
Stepping motor drive circuit designed for low power drain GSFC-198	B65-10026	01	<b>ANGULAR MOTION</b> System measures angular displacement without contact LANGLEY-46	B65-10073	01
Phase detector circuit synthesizes own reference signal M-FS-247	B65-10060	01	Universal bellows joint restraint permits angular and offset movement WDD-102	B65-10371	05
Traveling-wave tube circuit simplifies microwave relay GSFC-299	B65-10127	01	<b>ANIMAL STUDY</b> A technique for making animal restraints ARC-25	B63-10564	05
Instrument calibrates low gas-rate flowmeters MSC-134	B65-10137	01	<b>ANNULAR PLATE</b> Fastener provides cooling and compensates for thermal expansion NU-0003	B65-10038	05
Logarithmic amplifier uses field effect transistors JPL-509	B65-10145	01	<b>ANODE</b> Tantalum cathode improves electron-beam evaporation of tantalum JPL-WDD-021	B65-10175	03
<b>AMPLITUDE</b> Device calibrates vibration transducers at amplitudes up to 20 G. M-FS-86	B63-10572	01	Titanium diaphragm makes excellent amplatron cathode support GSFC-394	B65-10298	01
<b>AMPLITUDE MODULATION</b> Solid-state laser transmitter is amplitude modulated MSC-121	B65-10238	01	Anodization process produces opaque, reflective coatings on aluminum M-FS-348	B65-10336	03
<b>ANALOG COMPUTER</b> Hybrid computer technique yields random signal probability distributions ARC-34	B65-10208	01	<b>ANTENNA</b> Polychart contour enables data extrapolation from multiple plotting charts M-FS-37	B64-10406	05
<b>ANALOG DATA</b> Digital logic elements provide additional functions from analog input MSC-64	B64-10064	01	Helical coaxial-resonator makes excellent RF filter GSFC-243	B65-10012	01
Auxiliary circuit enables automatic monitoring of EKG MSC-106	B65-10142	01	Oceanborne transponder platform has good stability M-FS-171	B65-10035	05
<b>ANALOG SIMULATION</b> Analog device simulates physiological waveforms MSC-51	B64-10109	01	<b>ANTENNA ARRAY</b> Modified interelement spacing improves Yagi antenna array LANGLEY-130	B65-10183	01
<b>ANALOG-TO-DIGITAL CONVERTER</b> Pneumotachometer counts respiration rate of human subject MSC-92	B64-10259	01	<b>APERTURE</b> Micromachining produces optical apertures to micron dimensions GSFC-206	B64-10211	05
Analog-to-digital converter has increased reliability and reduced power consumption GSFC-246	B65-10194	01	<b>ARC GENERATOR</b> Magnetic field controls carbon arc tail flame MSC-139	B65-10108	01
Simple pulse counting circuit computes sum of squares GSFC-391	B65-10260	01	<b>ARC HEATING</b> Carbon arc ignition improved by simple auxiliary circuit MSC-103	B65-10018	01
Electronic ohmmeter provides direct digital output GSFC-363	B65-10274	01	<b>ARC WELDING</b> Photosensors used to maintain welding electrode-to-joint alignment MSC-243	B65-10401	05
Nonlinear feedback reduces analog-to-digital converter error ARC-46	B65-10277	01	<b>ARITHMETIC AND LOGIC UNIT /ALU/</b> Transfluxor circuit amplifies sensing current for computer memories JPL-406	B63-10255	01
Variable word length encoder reduces TV bandwidth requirements LANGLEY-87	B65-10345	01	<b>AROMATIC COMPOUND</b> Irradiation improves properties of an aromatic polyester		
<b>ANALYZER</b> Pulse height analyzer operates at high repetition rates, low power WDD-046	B65-10041	01			

SUBJECT INDEX

LANGLEY-115	B65-10164	03	Vacuum-type backup bar speeds weld repairs	B63-10384	05
<b>ARTERY</b>			M-FS-12		
Blood-pressure measuring system gives accurate graphic output			Mounting for diodes provides efficient heat sink		
MSC-191	B65-10365	01	M-FS-197	B64-10283	01
<b>ATMOSPHERIC PRESSURE</b>			<b>BARIUM SULFIDE</b>		
Segmented electrode increases operating pressure of MHD accelerator			Crack detection method is safe in presence of liquid oxygen		
LANGLEY-95	B65-10356	02	M-FS-236	B65-10107	03
<b>ATMOSPHERIC TURBULENCE</b>			<b>BATTERY</b>		
Rough surface improves stability of air-sounding balloons			Pressure sensor responds only to shock wave		
M-FS-320	B65-10326	05	M-FS-238	B65-10184	01
<b>ATTITUDE INDICATOR</b>			Composite seal reduces alkaline battery leakage		
Hydraulic device provides accurate displacements to microinches			GSFC-337	B65-10271	01
MSC-112	B65-10230	05	<b>BEACON</b>		
FM/CW system measures aircraft attitude			High-intensity flashing beacon powered by mercury cells		
M-FS-276	B65-10290	01	LANGLEY-80	B65-10361	01
<b>AUDIO EQUIPMENT</b>			<b>BEAM SWITCHING</b>		
High-gain amplifier has excellent stability and low power consumption			Brushless DC motor uses electron beam switching tube as commutator		
GSFC-272	B65-10138	01	GSFC-345	B65-10237	01
<b>AUDIOFREQUENCY</b>			<b>BEARING</b>		
Circuit reduces distortion of FM modulator			Device transmits rotary motion through hermetically sealed wall		
GSFC-257	B65-10152	01	JPL-303	B63-10198	05
<b>AUTOMATIC CONTROL</b>			Gallium useful bearing lubricant in high-vacuum environment		
New low-level A-C amplifier provides adjustable noise cancellation and automatic temperature compensation			LEWIS-12	B63-10337	03
ARC-2	B63-10003	04	Molybdenum disulfide mixtures make effective high-vacuum lubricants		
Level of super-cold liquids automatically maintained by levelometer			M-FS-54	B63-10453	03
JPL-397	B63-10250	01	Lead oxide ceramic makes excellent high-temperature lubricant		
Unmanned seismometer levels self, corrects drift errors			LEWIS-144	B64-10116	03
GSFC-100	B63-10551	01	Bearing transmits rotary and axial motion		
<b>AXIAL STRESS</b>			LANGLEY-27	B64-10130	05
Bearing transmits rotary and axial motion			Pneumatic power is transmitted through air bearing		
LANGLEY-27	B64-10130	05	MSC-8	B64-10141	05
Testing device subjects elastic materials to biaxial deformations			Fluid pressure used to test turbopump bearings		
JPL-616	B65-10189	03	NU-0001	B65-10024	03
<b>B</b>					
<b>BALANCE</b>			Nonresonant support facilitates vibration testing of structures		
System measures unidirectional forces, excludes extraneous forces			M-FS-224	B65-10039	05
LEWIS-170	B65-10154	05	<b>BELLOWS</b>		
<b>BALL BEARING</b>			Device transmits rotary motion through hermetically sealed wall		
Ball bearing used in design of rugged flow-meter			JPL-303	B63-10198	05
LEWIS-159	B64-10170	05	Composite, vacuum-jacketed tubing replaces bellows in cryogenic systems		
Miniature bearings lubricated by sonic dispersion method			LEWIS-67	B63-10368	05
M-FS-202	B65-10106	03	Filler device for handling hot corrosive materials		
Control of component differential hardness increases bearing life			MSC-85	B64-10166	03
LEWIS-190	B65-10251	05	Fastener provides cooling and compensates for thermal expansion		
<b>BANDWIDTH</b>			NU-0003	B65-10038	05
Bandwidth switching is transient-free, avoids loss of loop lock			Mouthpiece adapter for pipettes protects mouth from harmful liquids		
W00-054	B64-10349	01	LANGLEY-47	B65-10043	03
Variable word length encoder reduces TV bandwidth requirements			Metal bellows custom-fabricated from tubing		
LANGLEY-87	B65-10345	01	LEWIS-192	B65-10150	05
<b>BAR</b>			Lightweight hinged bellows restraint has high load capacity		
Novel clamps align large rocket cases, eliminate back-up bars			W00-151	B65-10341	03
M-FS-1	B63-10376	05			

SUBJECT INDEX

Universal bellows joint restraint permits angular and offset movement WOO-102	B65-10371	05	from harmful liquids LANGLEY-47	B65-10043	03
<b>BENDING</b> Handtool bends component leads accurately M-FS-308	B65-10181	05	Photoelectric sensor output controlled by eyeball movements M-FS-274	B65-10079	01
<b>BENDING FATIGUE</b> Machine tests crease durability of sheet materials JPL-604	B64-10178	05	Simulator produces physiological waveforms MSC-94	B65-10091	01
<b>BENDING MOMENT</b> Metal-bending brake facilitates lightweight, close-tolerance fabrication ARC-29	B64-10069	05	Tiny biomedical amplifier combines high performance, low power drain ARC-41	B65-10203	01
<b>BERYLLIUM OXIDE</b> Indium foil with beryllia washer improves transistor heat dissipation GSFC-42	B63-10033	01	Rugged pressed disk electrode has low contact potential MSC-158	B65-10320	01
Carbon-arc rod holder has long life, reduces arc splatter MSC-144	B65-10095	03	Direct force-measuring transducer used in blood pressure research ARC-53	B65-10325	01
<b>BILLET</b> Rapid billet loader aids extrusion of refractory metals LEWIS-50	B63-10354	05	<b>BISMUTH OXIDE</b> IR-transmission glasses formed from oxides of bismuth and tellurium M-FS-279	B65-10190	03
<b>BINARY CODE</b> Frequency divider is free of spurious outputs GSFC-308	B65-10334	01	<b>BLACK BODY RADIATION</b> Reference black body is compact, convenient to use ARC-3	B63-10004	03
<b>BINARY DATA</b> Logic redundancy improves digital system reliability JPL-SC-069	B65-10025	01	<b>BLADDER</b> Inflatable bladder provides accurate calibration of pressure switch M-FS-367	B65-10279	01
Frequency discriminator with binary output eliminates tuned circuits M-FS-376	B65-10349	01	<b>BLADE</b> Blade valve isolates compartment in pipe, opens to allow free flow JPL-585	B64-10188	05
Binary counter accumulates time by complementary preset MSC-242	B65-10399	01	<b>BLOOD PRESSURE</b> Direct force-measuring transducer used in blood pressure research ARC-53	B65-10325	01
<b>BINARY MIXTURE</b> Rapid helium-air analyzer can measure other binary gas mixtures LANGLEY-16	B63-10557	03	Blood-pressure measuring system gives accurate graphic output MSC-191	B65-10365	01
<b>BINARY SUMMATOR</b> Simple circuit performs binary addition and subtraction GSFC-399	B65-10355	01	<b>BLOWER</b> Composite, vacuum-jacketed tubing replaces bellows in cryogenic systems LEWIS-67	B63-10368	05
Binary counter uses fluid logic elements M-FS-323	B65-10377	01	<b>BODY OF REVOLUTION</b> Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114	05
<b>BIOINSTRUMENTATION</b> New low-level A-C amplifier provides adjustable noise cancellation and automatic temperature compensation ARC-2	B63-10003	04	<b>BOLOMETER</b> Wedge immersed thermistor bolometer measures infrared radiation GSFC-443	B65-10330	02
Improved electrode gives high-quality biological recordings MSC-17	B64-10025	04	<b>BONDING</b> New method forms bond line free of voids LANGLEY-20	B63-10558	05
Device induces lungs to maintain known constant pressure MSC-50	B64-10108	04	Elastomers bonded to metal surfaces seal electrochemical cells GSFC-168	B64-10113	03
Subminiature biotelemetry unit permits remote physiological investigations ARC-39	B64-10171	01	Screening technique makes reliable bond at room temperature M-FS-227	B65-10004	03
Inexpensive, stable circuit measures heart rate MSC-95	B65-10010	01	Thermocompression bonding produces efficient surface-barrier diode JPL-SC-066	B65-10007	05
Improved conductive paste secures biomedical electrodes MSC-107	B65-10015	03	Thermistor connector assembly increases accuracy of measurements LANGLEY-62	B65-10045	01
Mouthpiece adapter for pipettes protects mouth			Selenium bond decreases On resistance of light-activated switch JPL-SC-101	B65-10324	01

SUBJECT INDEX

C

<b>BOOLEAN ALGEBRA</b>					
Veitch diagram plotter simplifies boolean functions	JPL-385	B63-10241	05		
<b>BOOM</b>					
Apparatus of small size can be extended into long, rigid boom	JPL-305	B63-10200	05		
Metal strip forms 21 foot boom, rolls up for compact storage	GSFC-151	B64-10011	05		
Scoop attachment makes helicopter recoveries easier and safer	MSC-130	B65-10229	05		
<b>BORON CARBIDE</b>					
Boron carbide whiskers produced by vapor deposition	HQ-24	B65-10261	03		
<b>BORON NITRIDE</b>					
Boron nitride housing cools transistors	WOO-079	B65-10289	01		
<b>BRAKE</b>					
Frictional wedge shock mount is inexpensive, has good damping characteristics	JPL-IT-1001	B63-10289	05		
Metal-bending brake facilitates lightweight, close-tolerance fabrication	ARC-29	B64-10069	05		
Compressed gas system operates semitrailer brakes during winching operation	JPL-0036	B64-10306	05		
Air brake-dynamometer accurately measures torque	LEWIS-163	B65-10312	05		
Hydraulic drive system prevents backlash	JPL-371	B65-10351	05		
<b>BRAZING</b>					
New alloy brazes titanium to stainless steel	MSC-102	B65-10060	05		
Titanium treatment improves brazed joints	MSC-127	B65-10153	05		
Refractory metals welded or brazed with tungsten inert gas equipment	LEWIS-219	B65-10319	05		
Inert-gas welding and brazing enclosure fabricated from sheet plastic	LEWIS-220	B65-10338	05		
Brazing method produces solid-solution bond between refractory metals	LEWIS-212	B65-10370	05		
Tungsten wire and tubing joined by nickel brazing	M-FS-394	B65-10391	05		
New brazing alloy eliminates metal-stress cracking	WOO-249	B65-10397	03		
<b>BRIDGE</b>					
Electronic modules easily separated from heat sink	MSC-142	B65-10186	02		
<b>BUBBLE</b>					
Instrument calibrates low gas-rate flowmeters	MSC-134	B65-10137	01		
<b>BUOY</b>					
Oceanborne transponder platform has good stability	M-FS-171	B65-10035	05		
				<b>CALIBRATION</b>	
				Variable light source with a million-to-one intensity ratio	JPL-WOO-008 B63-10424 03
				Fluid-pressure meter can be calibrated without removal from flow line	M-FS-98 B63-10502 05
				Device calibrates vibration transducers at amplitudes up to 20 G.	M-FS-86 B63-10572 01
				Attachment converts microscope to point source autocollimator	JPL-499 B64-10124 05
				Raster linearity of video cameras calibrated with precision tester	GSFC-200 B64-10209 01
				Gage measures electrical connector pin retention force	JPL-SC-071 B65-10034 03
				Metal diaphragm used to calibrate miniature transducers	M-FS-207 B65-10059 01
				Oil-damped mercury pool makes precise optical alignment tool	GSFC-353 B65-10253 02
				Simple device produces accelerometer calibration pulse	M-FS-363 B65-10269 01
				Inflatable bladder provides accurate calibration of pressure switch	M-FS-367 B65-10279 01
				Volumetric system calibrates meters for large flow rates	WOO-130 B65-10323 05
				Noncontacting vibration transducer has constant sensitivity	LANGLEY-99 B65-10392 01
				<b>CALIBRATOR</b>	
				Explosives actuate nonmagnetic indexing device	GSFC-237 B65-10017 05
				Instrument calibrates low gas-rate flowmeters	MSC-134 B65-10137 01
				<b>CALORIMETER</b>	
				Probe measures characteristics of hot gas stream	M-FS-240 B65-10133 02
				Servo calorimeter measures material heating rate	NU-0024 B65-10247 01
				<b>CAMERA</b>	
				System selects framing rate for spectrograph camera	LANGLEY-55 B65-10086 01
				Planetary camera control improves microfiche production	HQ-1 B65-10313 01
				Modified procedure speeds camera copy layout for offset printing	GSFC-424 B65-10373 02
				<b>CAMERA SHUTTER</b>	
				Electromechanically operated camera shutter provides uniform exposure	JPL-357 B63-10227 01
				Camera shutter is actuated by electric signal	ARC-20 B63-10560 05

SUBJECT INDEX

**CAPACITANCE**

Thin-film resistors used in functional electronic blocks  
GSFC-380 B65-10305 01

**CAPACITOR**

Improved sensor counts micrometeoroid penetrations  
LEWIS-76 B63-10443 01

Circuit switches latching relay in response to signals of different polarity  
WOO-055 B63-10508 01

Highly efficient square-wave oscillator operator at high power levels  
GSFC-112 B63-10554 01

Thermistor connector assembly increases accuracy of measurements  
LANGLEY-62 B65-10045 01

Microparticle impact sensor measures energy directly  
GSFC-252 B65-10048 01

Digital-output cardiometer measures rapid changes in heartbeat rate  
MSC-133 B65-10143 01

Circuit reduces distortion of FM modulator  
GSFC-257 B65-10152 01

Electrostatically driven dynamic capacitor employs capacitive feedback  
JPL-771 B65-10293 01

Coaxial capacitor used to determine fluid density  
LEWIS-232 B65-10296 02

Compact SCR trigger circuit for ignitron switch operates efficiently  
M-FS-371 B65-10347 01

Three-dimensional wire-mesh capacitor system measures fluid density  
WOO-194 B65-10379 01

**CARBON ARC**

Carbon arc ignition improved by simple auxiliary circuit  
MSC-103 B65-10018 01

Carbon-arc rod holder has long life, reduces arc splatter  
MSC-144 B65-10095 03

Magnetic field controls carbon arc tail flame  
MSC-139 B65-10108 01

**CARBON DIOXIDE**

Gas diffusion cell removes carbon dioxide from occupied airtight enclosures  
MSC-118 B64-10319 03

**CARBON DIOXIDE CONCENTRATION**

Test strips detect different CO2 concentrations in closed compartments  
MSC-210 B65-10390 03

**CARBON DIOXIDE REMOVAL**

Removable well in reaction flask facilitates carbon dioxide collection  
ARC-47 B65-10316 03

**CARDIOGRAPHY**

Digital cardiometer computes and displays heartbeat rate  
MSC-93 B64-10258 01

Digital-output cardiometer measures rapid changes in heartbeat rate  
MSC-133 B65-10143 01

**CARRIER SYSTEM**

Phase shift frequency synthesizer is efficient, small in size  
M-FS-250 B65-10169 01

**CASE**

Compact cartridge drives coded tape at constant readout speed  
JPL-472 B64-10222 01

**CASTING**

Refractory ceramic has wide usage, low fabrication cost  
M-FS-67 B63-10481 03

Plastic molds reduce cost of encapsulating electric cable connectors  
M-FS-69 B63-10568 05

Pressure molding of powdered materials improved by rubber mold insert  
WOO-100 B64-10270 03

Lightweight aluminum casting alloy is useful at cryogenic temperatures  
M-FS-267 B65-10092 03

Epoxy-resin patterns speed shell-molding of aluminum parts  
M-FS-303 B65-10177 05

**CATALYST**

Compact assembly generates plastic foam, inflates flotation bag  
LANGLEY-96 B65-10090 05

Plated nickel wire mesh makes superior catalyst bed  
MSC-216 B65-10321 03

**CATALYTIC ACTIVITY**

Crypumping of hydrogen in vacuum chambers is aided by catalytic oxidation of hydrogen  
LEWIS-15 B63-10340 05

**CATHODE**

Wire winding increases lifetime of oxide-coated cathodes  
LEWIS-154 B65-10032 03

Tantalum cathode improves electron-beam evaporation of tantalum  
JPL-WOO-021 B65-10175 03

Titanium diaphragm makes excellent amplatron cathode support  
GSFC-394 B65-10298 01

**CAVITY**

Sensitive low-pressure relief valve has positive seating against leakage  
WOO-041 B64-10278 05

**CENTRIFUGAL FORCE**

Helical tube separates nitrogen gas from liquid nitrogen  
JPL-398 B63-10251 05

Centrifugal device separates liquid from gas  
MSC-282 B65-10394 05

**CERAMAL PROTECTIVE COATING**

Air-cured ceramic coating insulates against high heat fluxes  
M-FS-150 B65-10357 03

**CERAMIC BONDING**

Mounting for diodes provides efficient heat sink  
M-FS-197 B64-10283 01

**CERAMIC COATING**

Gate valve with ceramic-coated base operates at high temperatures  
ARC-23 B63-10562 03

Ceramic-coated boat is chemically inert, provides good heat transfer  
LANGLEY-90 B65-10063 05

**CERAMICS**

Refractory ceramic has wide usage, low fabrication cost  
M-FS-67 B63-10481 03

SUBJECT INDEX

Lead oxide ceramic makes excellent high-temperature lubricant LEWIS-144	B64-10116	03	Computer circuit will fit on single silicon chip JPL-513	B63-10514	01
Fabrication method produces high-grade alumina crucibles M-FS-216	B65-10078	05	Simple circuit provides adjustable voltage with linear temperature variation JPL-W00-029	B63-10537	01
Ceramic materials purified by experimental method LEWIS-225	B65-10270	03	Transistorized trigger circuit is frequency-controllable GSFC-111	B63-10553	01
<b>CESIUM IODIDE</b> Cesium iodide crystals fused to vacuum tube faceplates GSFC-67	B63-10476	03	Simple circuit continuously monitors thermocouple sensor M-FS-61	B63-10567	01
<b>CHANNEL</b> Integral coolant channels simply made by melt-out method M-FS-91	B63-10497	05	Circuit controls transients in SCR inverters GSFC-120	B63-10600	01
Logic redundancy improves digital system reliability JPL-SC-069	B65-10025	01	Monostable circuit with tunnel diode has fast recovery GSFC-132	B63-10603	01
Pulsed plasma accelerator operates repetitively without complex controls LANGLEY-48	B65-10062	01	Temperature-sensitive network drives astable multivibrator GSFC-137	B63-10609	01
Spiraled channels improve heat transfer between fluids JPL-694	B65-10291	02	Circuit reliability boosted by soldering pins of disconnect plugs to sockets JPL-447	B64-10002	01
<b>CHART</b> Polychart contour enables data extrapolation from multiple plotting charts M-FS-37	B64-10406	05	Low-power transistorized circuit provides staircase waveform GSFC-48	B64-10007	01
<b>CHASSIS</b> Modular chassis simplifies packaging and interconnecting of circuit boards JPL-236A	B63-10174	01	Efficient circuit triggers high-current, high-voltage pulses MSC-14	B64-10024	01
Rack mount device quickly inserts or extracts chassis units MSC-244	B65-10385	05	Continuity tester screens out faulty socket connections JPL-596	B64-10065	01
Insulator-holder protects transistors in dense electronic assemblies MSC-214	B65-10389	01	Ring counter may be advanced or retarded by command signal GSFC-101	B64-10144	01
<b>CHEMICAL ANALYSIS</b> Removable well in reaction flask facilitates carbon dioxide collection ARC-47	B65-10316	03	Temperature-compensation circuit stabilizes performance of vidicons JPL-486	B64-10226	01
Instrument performs nondestructive chemical analysis, data can be telemetered JPL-SC-078	B65-10317	01	Circuit converts AM signals to FM for magnetic recording GSFC-227	B65-10001	01
<b>CHEMICAL COMPOUND</b> Crack detection method is safe in presence of liquid oxygen M-FS-236	B65-10107	03	Tunnel-diode circuit features zero-level clipping GSFC-241	B65-10002	01
<b>CHEMICAL MILLING</b> Electroless nickel resist used in alkali-etching of aluminum GSFC-284	B65-10162	03	Screening technique makes reliable bond at room temperature M-FS-227	B65-10004	03
Reusable neoprene jacket protects parts for chemical milling W00-071	B65-10179	03	Circuit improvement produces monostable multivibrator with load-carrying capability GSFC-34A	B65-10011	01
<b>CHEMILUMINESCENCE</b> Porous glass makes effective substrate for ozone-sensing reagent GSFC-388	B65-10364	03	Zener diode function generator requires no external reference voltage JPL-33	B65-10013	01
<b>CIRCUIT</b> Circuit switches latching relay in response to signals of different polarity W00-055	B63-10508	01	Use of tear ring permits repair of sealed module circuitry M-FS-210	B65-10014	05
Frequency-shift-keyer circuit improves PCM conversion for radio transmission GSFC-80	B63-10511	01	Carbon arc ignition improved by simple auxiliary circuit MSC-103	B65-10018	01
			Stepping motor drive circuit designed for low power drain GSFC-198	B65-10026	01
			Ionization vacuum gage starts quickly, is unaffected by spurious currents JPL-304	B65-10036	02
			Pulse generator permits nondestructive testing of component breakdown voltage		

SUBJECT INDEX

MSC-122	B65-10054	01	M-FS-245	B65-10209	01
FM oscillator uses tetrode transistor JPL-B2	B65-10055	01	Voltage controlled oscillator is easily aligned, has low phase noise JPL-510	B65-10223	01
Vibrating-membrane electrometer has high conversion gain ARC-38	B65-10056	01	Simple BCD circuit accurately counts to 24 GSFC-317	B65-10225	01
Feedback oscillator functions as low-level pulse stretcher GSFC-261	B65-10069	01	Simple circuit produces high-speed, fixed duration pulses GSFC-285	B65-10228	01
Synchronized pulse generator needs no external power GSFC-274	B65-10072	01	Electrometer has automatic zero bias control GSFC-350	B65-10242	01
Light-sensitive potentiometer measures product of two variables GSFC-240	B65-10076	01	Electrometer preamplifier has drift correction feedback JPL-SC-074	B65-10267	01
Phase detector circuit synthesizes own reference signal M-FS-247	B65-10080	01	Electronic ohmmeter provides direct digital output GSFC-363	B65-10274	01
System selects framing rate for spectrograph camera LANGLEY-55	B65-10086	01	Added diodes increase output of balanced mixer circuit GSFC-354	B65-10276	01
Simple circuit functions as frequency discriminator for PFM signals GSFC-267	B65-10102	01	Compact SCR trigger circuit for ignitron switch operates efficiently M-FS-371	B65-10347	01
Unijunction frequency divider is free of backward loading JPL-W00-010	B65-10112	01	Multiphase clock-pulse generator uses simplified circuitry M-FS-297	B65-10353	01
Simplified electrometer has excellent operating characteristics JPL-413	B65-10125	01	Adhesive-backed terminal board eliminates mounting screws MSC-173	B65-10396	01
Traveling-wave tube circuit simplifies microwave relay GSFC-299	B65-10127	01	<b>CIRCUIT BOARD</b> Modular chassis simplifies packaging and interconnecting of circuit boards JPL-236A	B63-10174	01
Piezoresistive gage tests pin-connector sockets JPL-675	B65-10128	01	Handtool bends component leads accurately M-FS-308	B65-10181	05
Simple circuit positions film frames in projector JPL-508	B65-10132	02	Handtool facilitates extraction of circuit modules LANGLEY-38	B65-10231	05
Instrument calibrates low gas-rate flowmeters MSC-134	B65-10137	01	<b>CIRCUIT RELIABILITY</b> Logic circuit exhibits optimum performance LANGLEY-129	B65-10193	01
High-gain amplifier has excellent stability and low power consumption GSFC-272	B65-10138	01	<b>CLAMP</b> Novel clamps align large rocket cases, eliminate back-up bars M-FS-1	B63-10376	05
Auxiliary circuit enables automatic monitoring of EKG MSC-106	B65-10142	01	Transistorized circuit clamps voltage with 0.1 percent error GSFC-196	B65-10118	01
Digital-output cardiometer measures rapid changes in heartbeat rate MSC-133	B65-10143	01	Self-aligning fixture used in lathe chuck jaw refacing FRC-21	B65-10198	05
Rotor position sensor switches currents in brushless Dc motors GSFC-315	B65-10151	01	Electrical cable connector-clamp has smooth exterior surface MSC-154	B65-10201	05
Circuit reduces distortion of FM modulator GSFC-257	B65-10152	01	Remotely operated clamping tool has positive grip NU-0020	B65-10254	05
Phase shift frequency synthesizer is efficient, small in size M-FS-250	B65-10169	01	<b>CLEANING</b> Stringent cleaning technique assures reliable epoxy bond GSFC-161	B64-10142	03
Pressure transducer system is force-balanced, has digital output M-FS-154	B65-10174	05	Portable tool cleans pipes and tubing MSC-238	B65-10375	05
DC to AC converter operates efficiency at low input voltages GSFC-130	B65-10178	01	<b>CLEAVAGE</b> Electronic modules easily separated from heat sink MSC-142	B65-10186	02
Oscillator circuit measures liquid level in tanks					

SUBJECT INDEX

<b>CLOCK</b>					
Variable frequency magnetic multivibrator generates stable square-wave output	GSFC-AE-21	B65-10124	01		
Simple BCD circuit accurately counts to 24	GSFC-317	B65-10225	01		
<b>CLOSED LOOP SYSTEM</b>					
Photoresistance analog multiplier has wide range	GSFC-360	B65-10287	01		
<b>CLOSURE</b>					
Valve designed with elastic seat	JPL-442	B65-10040	05		
<b>CLUTCH</b>					
Quick-acting clutch disengages idle drive motor	GSFC-143	B64-10028	05		
<b>COATING</b>					
Elastomers bonded to metal surfaces seal electrochemical cells	GSFC-168	B64-10113	03		
Coating method enables low-temperature brazing of stainless steel	NU-0030	B65-10250	03		
Special coatings control temperature of structures	GSFC-444	B65-10337	03		
Pigmented coating resists thermal shock	JPL-SC-083	B65-10354	03		
Nickel/tin coating protects threaded fasteners in corrosive environment	MSC-253	B65-10398	03		
<b>COAXIAL CABLE</b>					
Modified rf coaxial connector ends vacuum chamber wiring problem	GSFC-150	B64-10010	01		
Compact coaxial connector for printed circuit adds reliability	MSC-57	B64-10016	01		
Cutter and stripper reduces coaxial cable connection time	ARC-40	B65-10094	05		
Lightweight coaxial cable connector reduces signal loss	JPL-720	B65-10244	01		
Boron trifluoride nuclear detector preamplifier uses single-cable connection	LEWIS-178	B65-10255	01		
<b>COBALT ALLOY</b>					
New cobalt alloys have high-temperature strength and long life in vacuum environments	LEWIS-47	B63-10351	03		
<b>COIL</b>					
Improved magnetometer uses toroidal gating coil	GSFC-249	B65-10103	01		
Collapsible truss structure is automatically expandable	GSFC-265	B65-10126	05		
Collar positions strip stock used to form coil on mandrel	JPL-198	B65-10130	05		
Spiral heater coils hand-formed with fixture	LEWIS-208	B65-10192	05		
<b>COLD PRESSING</b>					
Integral ribs formed in metal panels by cold-press extrusion	M-FS-230	B65-10141	05		
<b>COLLECTOR</b>					
Wide-aperture solar energy collector is light in weight	JPL-SC-055	B65-10046	02		
Plastic bags in evacuated chamber make lightweight gas sampling system	FRC-31	B65-10264	01		
Removable well in reaction flask facilitates carbon dioxide collection	ARC-47	B65-10316	03		
<b>COLLOID</b>					
Magnetic fluid readily controlled in zero gravity environment	LEWIS-126	B65-10335	03		
<b>COLORIMETRY</b>					
Test strips detect different CO2 concentrations in closed compartments	MSC-210	B65-10390	03		
<b>COLUMN</b>					
Extendible column can be stowed on drum	JPL-686	B65-10191	05		
<b>COMBUSTION</b>					
Plastic bags in evacuated chamber make lightweight gas sampling system	FRC-31	B65-10264	01		
<b>COMMAND SYSTEM</b>					
Remote control electrical switching system has 1000-output capability	M-FS-380	B65-10318	01		
<b>COMMUNICATION SYSTEM</b>					
Superconductor magnets used for stagger-tuning traveling-wave maser	GSFC-292	B65-10165	01		
Lightweight coaxial cable connector reduces signal loss	JPL-720	B65-10244	01		
<b>COMMUNICATIONS DEVICE</b>					
Simple circuit produces high-speed, fixed duration pulses	GSFC-285	B65-10228	01		
Circuit maintains digital decision threshold at preset level	M-FS-331	B65-10281	01		
<b>COMPENSATION</b>					
Fastener provides cooling and compensates for thermal expansion	NU-0003	B65-10038	05		
<b>COMPENSATOR</b>					
Detector circuit compensates for vidicon beam current variations	GSFC-310	B65-10212	01		
<b>COMPONENT RELIABILITY</b>					
Improved insertion-loss tester	JPL-358	B64-10080	01		
Analog-to-digital converter has increased reliability and reduced power consumption	GSFC-246	B65-10194	01		
Interferometer construction assures parallelism of critical components	JPL-704	B65-10292	02		
<b>COMPOSITE STRUCTURE</b>					
Composite seal reduces alkaline battery leakage	GSFC-337	B65-10271	01		
<b>COMPRESSIBLE FLUID</b>					
Coaxial capacitor used to determine fluid density	LEWIS-232	B65-10296	02		

SUBJECT INDEX

<b>COMPUTATION</b>			JPL-447	B64-10002	01		
Disk calculator indicates legible lettering size for slide projection	GSFC-409	B65-10339	05	Modified rf coaxial connector ends vacuum chamber wiring problem	GSFC-150	B64-10010	01
<b>COMPUTER</b>				Compact coaxial connector for printed circuit adds reliability	MSC-57	B64-10016	01
Computer determines high-frequency phase stability	GSFC-113	B63-10555	01	Continuity tester screens out faulty socket connections	JPL-596	B64-10065	01
Improved wire memory matrix uses very little power	JPL-SC-167	B65-10359	01	Connector seals fluid lines at cryogenic temperatures and high vacuums	GSFC-253	B64-10327	05
<b>COMPUTER DESIGN</b>				Gage measures electrical connector pin retention force	JPL-SC-071	B65-10034	03
Modular chassis simplifies packaging and interconnecting of circuit boards	JPL-236A	B63-10174	01	Feed-through has polyterminal feature	M-FS-25	B65-10057	01
Veitch diagram plotter simplifies boolean functions	JPL-385	B63-10241	05	Cutter and stripper reduces coaxial cable connection time	ARC-40	B65-10094	05
Transfluxor circuit amplifies sensing current for computer memories	JPL-406	B63-10255	01	New nut and sleeve improve flared connections	M-FS-194	B65-10180	05
Computer circuit will fit on single silicon chip	JPL-513	B63-10514	01	Improved solderless connector is easily disconnected	JPL-SC-060	B65-10197	01
New sintering process adjusts magnetic value of ferrite cores	GSFC-129	B63-10606	01	Electrical cable connector-clamp has smooth exterior surface	MSC-154	B65-10201	05
Molded elastomer provides compact ferrite-core holder, simplifies assembly	JPL-584	B64-10084	05	Electrical probe ensures reliable contact in socket	M-FS-315	B65-10215	01
<b>COMPUTER METHOD</b>				Lightweight coaxial cable connector reduces signal loss	JPL-720	B65-10244	01
Computer modification reduces time of performing iterative division	M-FS-166	B65-10005	01	Thermocouple-to-instrumentation connector features quick assembly	NU-0022	B65-10246	05
Density trace made with computer printout	GSFC-322	B65-10200	01	Indexing device ensures proper mating of electrical connectors	MSC-155	B65-10263	01
Uppercase and lowercase computer printout increases readability	HQ-12	B65-10286	01	Feed-through connector withstands high temperatures in vacuum environment	GSFC-442	B65-10328	01
Delayed ripple counter simplifies square-root computation	GSFC-398	B65-10343	01	Keyed plugs and sockets prevent improper connections	MSC-231	B65-10381	01
<b>COMPUTER PROGRAM</b>				Threaded split ring connector separates structural sections	LANGLEY-145	B65-10383	05
Computer programs simplify optical system analysis	GSFC-306	B65-10093	01	Shrinkable sleeve eliminates shielding gap in RF cable	WOO-207	B65-10387	01
<b>CONDUCTIVITY</b>				<b>CONTACT</b>			
Meter accurately measures flow of low-conductivity fluids	JPL-0021	B63-10280	01	Improved holder protects crystal during high acceleration and impact	JPL-463	B65-10037	05
<b>CONE</b>				<b>CONTACT LENS</b>			
Lathe attachment used to machine elliptical cones	MSC-100	B65-10168	05	Thin transparent films formed from powdered glass	GSFC-352	B65-10217	03
<b>CONNECTOR</b>				<b>CONTACT POTENTIAL</b>			
Modular chassis simplifies packaging and interconnecting of circuit boards	JPL-236A	B63-10174	01	Electrometer has automatic zero bias control	GSFC-350	B65-10242	01
Portable display paneling has wide use, easy take down and assembly	ARC-17	B63-10435	05	Rugged pressed disk electrode has low contact potential	MSC-158	B65-10320	01
Connector for thermocouple leads saves costly wire, makes reliable connectors	LANGLEY-26	B63-10529	01				
Plastic molds reduce cost of encapsulating electric cable connectors	M-FS-69	B63-10568	05				
Circuit reliability boosted by soldering pins of disconnect plugs to sockets							

SUBJECT INDEX

<b>CONTAINER</b>				Inexpensive check valve is installed in standard AN fittings JPL-2A	B65-10222	05
Lightweight magnesium-lithium alloys show promise M-FS-17	B63-10389	03				
Electrically heated diaphragm eliminates use of pyrotechnics MSC-241	B65-10400	01		<b>CONVERTER</b> Transistorized converter provides nondissipative regulation GSFC-238	B64-10305	01
<b>CONTAMINATION</b>				DC to AC converter operates efficiently at low input voltages GSFC-130	B65-10178	01
Magnetic field controls carbon arc tail flame MSC-139	B65-10108	01				
Double gloves reduce contamination of dry box atmosphere LEWIS-211	B65-10117	03		<b>COOLANT</b> Integral coolant channels simply made by melt-out method M-FS-91	B63-10497	05
<b>CONTINUOUS FUNCTION</b>				<b>COOLING</b> Cooling method prolongs life of hot-wire transducer LEWIS-41	B63-10344	02
Ball-and socket joints provide accurate biaxial gimbal JPL-658	B65-10205	05		Boron nitride housing cools transistors WOO-079	B65-10289	01
<b>CONTINUOUS WAVE /CW/ RADAR</b>				<b>COORDINATE SYSTEM</b> Solar-angle sensor has no moving parts JPL-418	B63-10260	02
FM/CW system measures aircraft attitude M-FS-276	B65-10290	01		<b>COPPER</b> Adherent protective coatings plated on magnesium-lithium alloy M-FS-365	B65-10294	03
<b>CONTOUR</b>				<b>COPPER SULFIDE</b> Crack detection method is safe in presence of liquid oxygen M-FS-236	B65-10107	03
Novel shock absorber features varying yield strengths MSC-63A	B64-10138	03		<b>CORROSION PREVENTION</b> Carbon-arc rod holder has long life, reduces arc splatter MSC-144	B65-10095	03
Noncontacting vibration transducer has constant sensitivity LANGLEY-99	B65-10392	01		Galvanic corrosion reduced in aluminum fabrications M-FS-272	B65-10140	03
<b>CONTROL DEVICE</b>				<b>CORROSION RESISTANCE</b> Removable preheater elements improve oxide induction furnace JPL-288	B63-10193	01
Knob linkage permits one-hand control of several operations MSC-30	B65-10022	05		Filler device for handling hot corrosive materials MSC-85	B64-10166	03
Simple control device senses solar position JPL-638	B65-10061	01		Solder flux leaves corrosion-resistant coating on metal JPL-611	B64-10206	03
Pulsed plasma accelerator operates repetitively without complex controls LANGLEY-48	B65-10062	01		Wide-angle sensor measures radiant heat energy in corrosive atmospheres M-FS-228	B65-10019	05
Variable frequency magnetic multivibrator generates stable square-wave output GSFC-AE-21	B65-10124	01		Inexpensive electrical connector is moisture and corrosionproof MSC-164	B65-10196	01
Zener diode controls switching of large direct currents MSC-188	B65-10350	01		Nickel/tin coating protects threaded fasteners in corrosive environment MSC-253	B65-10398	03
Rack mount device quickly inserts or extracts chassis units MSC-244	B65-10385	05		<b>COUNTER</b> Ring counter may be advanced or retarded by command signal GSFC-101	B64-10144	01
<b>CONTROL SYSTEM</b>				Novel circuit combines pulse stretcher with NOR gate GSFC-187	B64-10150	01
Bidirectional torque filter eliminates backlash GSFC-335	B65-10148	05		Simple BCD circuit accurately counts to 24 GSFC-317	B65-10225	01
Planetary camera control improves microfiche production HQ-1	B65-10313	01		Binary counter accumulates time by complementary preset MSC-242	B65-10399	01
Remote control electrical switching system has 1000-output capability M-FS-380	B65-10318	01				
<b>CONTROL VALVE</b>						
High-pressure regulating system prevents pressure surges JPL-231	B63-10170	05				
Flow control valve is independent of pressure drop JPL-WOO-039	B65-10121	05				
Improved fluid control valve extends diaphragm life JPL-345	B65-10147	05				
Fluid check valve has fail-safe feature JPL-0019	B65-10207	05				

SUBJECT INDEX

<b>COUNTERBALANCE SYSTEM</b>					
Self-balancing beam permits safe, easy load handling under overhang				W00-142	B65-10227 05
M-FS-84	B63-10571	05			
<b>COUPLING</b>				<b>CRYOGENIC STORAGE</b>	
New coupling compensates for shaft misalignment				Lightweight door seals cryogenic container against diaphragm type loading	
NU-0013	B65-10077	05		M-FS-476	B65-10402 05
Device disconnects several couplings simultaneously				<b>CRYOGENIC TEMPERATURE</b>	
JPL-226	B65-10163	05		Connector seals fluid lines at cryogenic temperatures and high vacuums	
Quick-disconnect coupling safe transfer of hazardous fluids				GSFC-253	B64-10327 05
LEWIS-125	B65-10202	01		Lightweight aluminum casting alloy is useful at cryogenic temperatures	
Diaphragm eliminates leakage in cryogenic fluid duct coupling				M-FS-267	B65-10092 03
W00-142	B65-10227	05		<b>CRYOPUMPING</b>	
<b>CRACK</b>				Cryopumping of hydrogen in vacuum chambers is aided by catalytic oxidation of hydrogen	
Crack detection method is safe in presence of liquid oxygen				LEWIS-15	B63-10340 05
M-FS-236	B65-10107	03		<b>CRYOSTAT</b>	
<b>CRACK FORMATION</b>				Low-cost insulation system for cryostats eliminates need for a vacuum	
New brazing alloy eliminates metal-stress cracking				LEWIS-64	B63-10365 03
W00-249	B65-10397	03		Apparatus permits flexure testing of specimens at cryogenic temperatures	
<b>CRANE</b>				M-FS-257	B65-10129 02
Speed-sensing device aids crane operators				Vacuum chamber provides improved insulation and support for cryostat	
WS-4	B64-10006	05		M-FS-415	B65-10368 02
<b>CROSS LINKING</b>				<b>CRYSTAL</b>	
Irradiation improves properties of an aromatic polyester				Cesium iodide crystals fused to vacuum tube faceplates	
LANGLEY-115	B65-10164	03		GSFC-67	B63-10476 03
<b>CRUCIBLE</b>				Improved holder protects crystal during high acceleration and impact	
Fabrication method produces high-grade alumina crucibles				JPL-463	B65-10037 05
M-FS-216	B65-10078	05		FM oscillator uses tetrode transistor	
<b>CRYOGENIC EQUIPMENT</b>				JPL-82	B65-10055 01
Cryogenic filter method produces super-pure helium and helium isotopes				Crystal measures short-term, large-magnitude forces	
JPL-374	B63-10235	03		JPL-77	B65-10187 01
Composite, vacuum-jacketed tubing replaces bellows in cryogenic systems				Voltage controlled oscillator is easily aligned, has low phase noise	
LEWIS-67	B63-10368	05		JPL-510	B65-10223 01
Cryogenic waveguide window is sealed with plastic foam				<b>CRYSTALLOGRAPHY</b>	
JPL-559	B63-10613	01		Spherical model provides visual aid for cubic crystal study	
Sensitive low-pressure relief valve has positive seating against leakage				LEWIS-108	B65-10065 03
W00-041	B64-10278	05		Rotating filters permit wide range of optical pyrometry	
Automatic thermal switch accelerates cooling-down of cryogenic system				LANGLEY-33	B65-10100 02
JPL-655	B65-10068	01		<b>CUBIC CRYSTAL</b>	
Insulation accelerates rate of cooling with cryogenic fluid				Spherical model provides visual aid for cubic crystal study	
MSC-161	B65-10240	02		LEWIS-108	B65-10065 03
<b>CRYOGENIC FLUID</b>				<b>CURRENT AMPLIFIER</b>	
Level of super-cold liquids automatically maintained by levelometer				New low-level A-C amplifier provides adjustable noise cancellation and automatic temperature compensation	
JPL-397	B63-10250	01		ARC-2	B63-10003 04
Liquid-level meter has no moving parts				Transfluxor circuit amplifies sensing current for computer memories	
M-FS-3	B63-10378	03		JPL-406	B63-10255 01
Inert gas spraying device aids in repair of hazardous systems				<b>CURRENT DISTRIBUTION</b>	
LEWIS-8B	B65-10115	05		Simple circuit functions as frequency discriminator for PFM signals	
Quick-disconnect coupling safe transfer of hazardous fluids				GSFC-267	B65-10102 01
LEWIS-125	B65-10202	01		Increased junction lead inductance ballasts high-frequency transistors	
Diaphragm eliminates leakage in cryogenic fluid duct coupling				GSFC-387	B65-10259 01
				<b>CURRENT STABILIZER</b>	
				Electropneumatic rheostat regulates high	

SUBJECT INDEX

current ARC-44	B65-10299	01	<b>DATA TRANSMISSION</b> Instrument performs nondestructive chemical analysis, data can be telemetered JPL-SC-078	B65-10317	01
<b>CURVED SURFACE</b> Flexible honeycomb structure can bend to fit compound curves M-FS-13	B63-10385	05	<b>DECELERATION</b> Kinetic-energy absorber employs frictional force between mating cylinders LEWIS-75	B63-10442	05
Lathe converted for grinding aspheric surfaces GSFC-115	B63-10556	05	Novel shock absorber features varying yield strengths MSC-63A	B64-10138	03
Device measures curved surface finish on gear teeth WOO-112	B65-10064	05	<b>DECISION ELEMENT</b> Circuit maintains digital decision threshold at preset level M-FS-331	B65-10281	01
<b>CUTTING</b> Cutter and stripper reduces coaxial cable connection time ARC-40	B65-10094	05	<b>DEGASSING</b> Baking enables McLeod gauge to measure in ultrahigh vacuum range GSFC-440	B65-10329	01
<b>CYLINDER</b> Supercold technique duplicates magnetic field in second superconductor JPL-376	B63-10237	05	<b>DELAY LINE</b> Gapped toroid provides infinite resolution of delay-line pickup GSFC-370	B65-10258	01
Shaped superconductor cylinder retains intense magnetic field JPL-381	B63-10238	01	<b>DENSITOMETER</b> Modified contour projector makes excellent contour densitometer LANGLEY-93	B65-10084	02
Simple mechanism combines positive locking and quick-release features WOO-4	B63-10420	05	<b>DENSITY MEASUREMENT</b> Density trace made with computer printout GSFC-322	B65-10200	01
Kinetic-energy absorber employs frictional force between mating cylinders LEWIS-75	B63-10442	05	Coaxial capacitor used to determine fluid density LEWIS-232	B65-10296	02
Seal allows blind assembly and thermal expansion of components NU-0005	B65-10053	05	Vibrating diaphragm measures high electrostatic field strengths MSC-189	B65-10352	01
Vacuum chamber provides improved insulation and support for cryostat M-FS-415	B65-10368	02	Three-dimensional wire-mesh capacitor system measures fluid density WOO-194	B65-10379	01
<b>D</b>					
<b>DAMAGE</b> Low-cost tool minimizes damage to O-rings during installation MSC-140	B65-10116	05	<b>DEPOSITION</b> Integral coolant channels simply made by melt-out method M-FS-91	B63-10497	05
Improved poppet valve provides positive damageproof seal M-FS-293	B65-10346	05	<b>DESTRUCTIVE TESTING</b> Force controlled solenoid drives microweld tester WOO-125	B65-10182	01
<b>DAMPING</b> Frictional wedge shock mount is inexpensive, has good damping characteristics JPL-IT-1001	B63-10289	05	<b>DETECTION</b> Continuity tester screens out faulty socket connections JPL-596	B64-10065	01
Shock absorber operates over wide range MSC-168	B65-10241	05	Use of photographs speeds inspection of printed-circuit boards MSC-72	B64-10118	01
<b>DATA PROCESSING</b> Transfluxor circuit amplifies sensing current for computer memories JPL-406	B63-10255	01	Transistor voltage comparator performs own sensing GSFC-228	B65-10028	01
<b>DATA READOUT SYSTEM</b> Nonlinear feedback reduces analog-to-digital converter error ARC-46	B65-10277	01	Weld leaks rapidly and safely detected M-FS-362	B65-10265	01
<b>DATA RECORDER</b> PCM magnetic tape system efficiency records and reproduces data GSFC-375	B65-10311	01	<b>DETECTOR</b> Device detects unbonded areas in plastic laminates WOO-206	B65-10380	01
<b>DATA REDUCTION</b> Polychart contour enables data extrapolation from multiple plotting charts M-FS-37	B64-10406	05	<b>DIAPHRAGM</b> Improved fluid control valve extends diaphragm life JPL-345	B65-10147	05
<b>DATA RETRIEVAL</b> Gapped toroid provides infinite resolution of delay-line pickup GSFC-370	B65-10258	01	Diaphragm eliminates leakage in cryogenic fluid duct coupling WOO-142	B65-10227	05

SUBJECT INDEX

Burst diaphragm protects vacuum vessel from internal pressure transients JPL-687	B65-10236	05	Hybrid computer technique yields random signal probability distributions ARC-34	B65-10208	01
Titanium diaphragm makes excellent amplifier cathode support GSFC-394	B65-10298	01	<b>DIGITAL DATA</b> Interferometer combines laser light source and digital counting system MSC-151	B65-10161	01
Vibrating diaphragm measures high electrostatic field strengths MSC-189	B65-10352	01	Sensitive electrometer features digital output GSFC-288	B65-10206	01
Die and telescoping punch form convolutions in thin diaphragm JPL-SC-135	B65-10393	05	<b>DIGITAL TECHNIQUE</b> Binary system generates sidereal rate from standard solar rate GSFC-190	B64-10200	01
Electrically heated diaphragm eliminates use of pyrotechnics MSC-241	B65-10400	01	Digital cardiometer computes and displays heartbeat rate MSC-93	B64-10258	01
<b>DIE</b> Guide for extrusion dies eliminates straightening operation LEWIS-152	B64-10014	05	Electron-beam deflection controlled by digital signals GSFC-385	B65-10283	02
Metal parts hydrosized by explosive force M-FS-289	B65-10170	05	<b>DIGITAL-TO-ANALOG CONVERTER</b> Digital logic elements provide additional functions from analog input MSC-64	B64-10064	01
Handtool bends component leads accurately M-FS-308	B65-10181	05	Transistorized circuit clamps voltage with 0.1 percent error GSFC-196	B65-10118	01
Fiberglass dies speed forming of large metal sheets M-FS-214	B65-10210	05	Pressure transducer system is force-balanced, has digital output M-FS-154	B65-10174	05
Die and telescoping punch form convolutions in thin diaphragm JPL-SC-135	B65-10393	05	Variable word length encoder reduces TV bandwidth requirements LANGLEY-87	B65-10345	01
<b>DIELECTRIC MATERIAL</b> Microparticle impact sensor measures energy directly GSFC-252	B65-10048	01	<b>DIGITAL TRANSDUCER</b> Frequency correction device uses digital circuitry GSFC-268	B65-10307	01
<b>DIELECTRICS</b> Spherical electrode eliminates high-voltage breakdown LEWIS-155	B65-10139	01	<b>DIMENSIONAL STABILITY</b> Collapsible truss structure is automatically expandable GSFC-265	B65-10126	05
<b>DIFFUSION</b> Fabrication method produces high-grade alumina crucibles M-FS-216	B65-10078	05	<b>DIODE</b> Simple circuit provides adjustable voltage with linear temperature variation JPL-W00-029	B63-10537	01
<b>DIFFUSION BONDING</b> Thoriated nickel bonded by solid-state diffusion method LANGLEY-116	B65-10220	03	Mounting for diodes provides efficient heat sink M-FS-197	B64-10283	01
Thermoelectric elements diffusion-bonded to tungsten electrodes GSFC-346	B65-10309	01	Modification increases light output of injection-luminescent diodes M-FS-192	B65-10006	01
Brazing method produces solid-solution bond between refractory metals LEWIS-212	B65-10370	05	Thermocompression bonding produces efficient surface-barrier diode JPL-SC-066	B65-10007	05
<b>DIFFUSION ELECTRODE</b> Segmented electrode increases operating pressure of MHD accelerator LANGLEY-95	B65-10356	02	Optical arrangement increases useful light output of semiconductor diodes JPL-SC-064	B65-10020	05
<b>DIGITAL COMMAND SYSTEM</b> Digital system accurately controls velocity of electromechanical drive GSFC-287	B65-10096	01	Logarithmic amplifier uses field effect transistors JPL-509	B65-10145	01
<b>DIGITAL COMPUTER</b> Small digital recording head has parallel bit channels, minimizes cross talk JPL-0029	B63-10284	01	Solid-state laser transmitter is amplitude modulated MSC-121	B65-10238	01
Logic redundancy improves digital system reliability JPL-SC-069	B65-10025	01	Added diodes increase output of balanced mixer circuit GSFC-354	B65-10276	01
Instrument calibrates low gas-rate flowmeters MSC-134	B65-10137	01	<b>DIOXIDE</b> IR-transmission glasses formed from oxides of bismuth and tellurium		

SUBJECT INDEX

M-FS-279	B65-10190	03	take down and assembly ARC-17	B63-10435	05
<b>DIRECT CURRENT /DC/</b>					
Liquid switch is remotely operated by low DC voltage GSFC-119	B63-10599	01	New low-level AC amplifier provides adjustable noise cancellation and automatic temperature compensation MSC-108	B65-10003	05
High-pass RF coaxial filter rejects DC and low frequency signals GSFC-73	B64-10173	01	<b>DISTILLATION APPARATUS</b> Emergency solar still desalts seawater MSC-135	B65-10214	03
Variable load automatically tests dc power supplies GSFC-291	B65-10105	01	<b>DISTRIBUTION FUNCTION</b> Polychart contour enables data extrapolation from multiple plotting charts M-FS-37	B64-10406	05
Rotor position sensor switches currents in brushless Dc motors GSFC-315	B65-10151	01	<b>DRAG BALANCE</b> Device measures fluid drag on test vehicles LANGLEY-34	B65-10195	01
DC to AC converter operates efficiency at low input voltages GSFC-130	B65-10178	01	<b>DRAG MEASUREMENT</b> Device measures fluid drag on test vehicles LANGLEY-34	B65-10195	01
Inductor flyback characteristic gives voltage regulator fast response GSFC-361	B65-10257	01	<b>DRILL</b> Rock bit requires no flushing medium to maintain drilling speed JPL-W00-031	B65-10109	05
Electropneumatic rheostat regulates high current ARC-44	B65-10299	01	Drill bit design assures clean holes in laminated materials W00-098	B65-10386	05
Zener diode controls switching of large direct currents MSC-188	B65-10350	01	<b>DRIVE</b> Quick-acting clutch disengages idle drive motor GSFC-143	B64-10028	05
<b>DIRECTIONAL CONTROL</b>			Bearing transmits rotary and axial motion LANGLEY-27	B64-10130	05
System measures unidirectional forces, excludes extraneous forces LEWIS-170	B65-10154	05	Threading hook facilitates safe recovery of heavy loads MSC-46	B64-10185	05
Magnetic-shift-register circuit controls step motor operations GSFC-340	B65-10226	01	Apparatus alters position of objects to facilitate demagnetization GSFC-234	B64-10277	05
<b>DISCHARGE</b>			Stepping motor drive circuit designed for low power drain GSFC-198	B65-10026	01
Auxiliary silver electrode eliminates two-step voltage discharge characteristic of silver-zinc cells GSFC-169	B64-10114	01	Hydraulic drive system prevents backlash JPL-371	B65-10351	05
<b>DISCONNECT DEVICE</b>			<b>DROP</b> Apparatus measures concentration of suspended droplets in gas streams LANGLEY-31	B64-10237	01
Device disconnects several couplings simultaneously JPL-226	B65-10163	05	<b>DUCTED FLOW</b> Lightweight hinged bellows restraint has high load capacity W00-151	B65-10341	03
<b>DISCRIMINATOR</b>			<b>DYE</b> Porous glass makes effective substrate for ozone-sensing reagent GSFC-388	B65-10364	03
Simple circuit functions as frequency discriminator for PFM signals GSFC-267	B65-10102	01	Test strips detect different CO2 concentrations in closed compartments MSC-210	B65-10390	03
<b>DISK</b>			<b>DYNAMIC LOAD</b> Pressure responsive seal handles static and dynamic loads GSFC-441	B65-10327	05
Modified interelement spacing improves Yagi antenna array LANGLEY-130	B65-10183	01	<b>DYNAMOMETER</b> Air brake-dynamometer accurately measures torque LEWIS-163	B65-10312	05
<b>DISPERSION</b>					
Anodization process produces opaque, reflective coatings on aluminum M-FS-348	B65-10336	03			
<b>DISPLACEMENT</b>					
Seismic transducer measures small horizontal displacements M-FS-81	B65-10029	05			
Transducer senses displacements of panels subjected to vibration ARC-37	B65-10085	01			
Interferometer combines laser light source and digital counting system MSC-151	B65-10161	01			
Hydraulic device provides accurate displacements to microinches MSC-112	B65-10230	05			
<b>DISPLAY SYSTEM</b>					
Portable display paneling has wide use, easy					

SUBJECT INDEX

E

<b>EDGE</b>					
Upsetting butt edge increases weld-joint strength					
M-FS-175	B64-10164	05			
<b>ELASTIC DEFORMATION</b>					
Testing device subjects elastic materials to biaxial deformations					
JPL-616	B65-10189	03			
<b>ELASTIC PROPERTY</b>					
Valve designed with elastic seat					
JPL-442	B65-10040	05			
<b>ELASTOMER</b>					
Elastic orifice automatically regulates gas bearings					
JPL-135	B63-10123	05			
Molded elastomer provides compact ferrite-core holder, simplifies assembly					
JPL-584	B64-10084	05			
Elastomers bonded to metal surfaces seal electrochemical cells					
GSFC-168	B64-10113	03			
Compact assembly generates plastic foam, inflates flotation bag					
LANGLEY-96	B65-10090	05			
<b>ELBOW</b>					
Stainless-steel elbows formed by spin forging					
M-FS-122	B63-10590	05			
Spring loaded beaded cable makes efficient wire puller					
WOO-108	B65-10031	05			
<b>ELECTRIC CONNECTOR</b>					
Inexpensive electrical connector is moisture and corrosionproof					
MSC-164	B65-10196	01			
<b>ELECTRIC CONTACT</b>					
Continuity tester screens out faulty socket connections					
JPL-596	B64-10065	01			
Lightweight coaxial cable connector reduces signal loss					
JPL-720	B65-10244	01			
<b>ELECTRIC CONTROL</b>					
Binary counter accumulates time by complementary preset					
MSC-242	B65-10399	01			
<b>ELECTRIC CURRENT</b>					
Igniting system for mercury vapor lamps protects transistorized sustaining supply					
JPL-421	B63-10262	01			
Pickup device reads pressures from ports in rotating mechanisms					
LEWIS-158	B65-10021	05			
Laser beam transmits electric power					
GSFC-293	B65-10158	01			
Sensitive electrometer features digital output					
GSFC-288	B65-10206	01			
Electrical probe ensures reliable contact in socket					
M-FS-315	B65-10215	01			
<b>ELECTRIC ENERGY</b>					
Camera shutter is actuated by electric signal					
ARC-20	B63-10560	05			
<b>ELECTRIC ENERGY STORAGE</b>					
Regenerative fuel cell combines high efficiency with low cost					
WOO-090	B65-10363	01			
<b>ELECTRIC EQUIPMENT</b>					
Hot-air soldering technique prevents overheating of electrical components					
GSFC-91	B63-10536	01			
Inexpensive electrical connector is moisture and corrosionproof					
MSC-164	B65-10196	01			
Electrical cable connector-clamp has smooth exterior surface					
MSC-154	B65-10201	05			
Electrical probe ensures reliable contact in socket					
M-FS-315	B65-10215	01			
Keyed plugs and sockets prevent improper connections					
MSC-231	B65-10381	01			
<b>ELECTRIC INSULATION</b>					
Connector for thermocouple leads saves costly wire, makes reliable connectors					
LANGLEY-26	B63-10529	01			
Continuity tester screens out faulty socket connections					
JPL-596	B64-10065	01			
Ceramic materials purified by experimental method					
LEWIS-225	B65-10270	03			
<b>ELECTRIC LEAD</b>					
Handtool bends component leads accurately					
M-FS-308	B65-10181	05			
<b>ELECTRIC MOTOR</b>					
Brushless DC motor uses electron beam switching tube as commutator					
GSFC-345	B65-10237	01			
<b>ELECTRIC POTENTIAL</b>					
Density trace made with computer printout					
GSFC-322	B65-10200	01			
<b>ELECTRIC WIRING</b>					
Circuit reliability boosted by soldering pins of disconnect plugs to sockets					
JPL-447	B64-10002	01			
<b>ELECTRO-OPTICS</b>					
Liquid-level meter has no moving parts					
M-FS-3	B63-10378	03			
Communication system uses modulated laser beam					
GSFC-377	B65-10333	01			
<b>ELECTROCARDIOGRAM</b>					
Digital cardiometer computes and displays heartbeat rate					
MSC-93	B64-10258	01			
Simulator produces physiological waveforms					
MSC-94	B65-10091	01			
Auxiliary circuit enables automatic monitoring of EKG					
MSC-106	B65-10142	01			
Digital-output cardiometer measures rapid changes in heartbeat rate					
MSC-133	B65-10143	01			
Tiny biomedical amplifier combines high performance, low power drain					
ARC-41	B65-10203	01			
<b>ELECTROCARDIOGRAPHY</b>					
Inexpensive, stable circuit measures heart rate					
MSC-95	B65-10010	01			
<b>ELECTROCHEMICAL CELL</b>					
Elastomers bonded to metal surfaces seal electrochemical cells					
GSFC-168	B64-10113	03			
Apparatus measures swelling of membranes in electrochemical cells					

SUBJECT INDEX

GSFC-280	B65-10087	01	Electromechanically operated camera shutter provides uniform exposure	JPL-357	B63-10227	01	
<b>ELECTRODE</b>							
Improved electrode gives high-quality biological recordings	MSC-17	B64-10025	04	Knob linkage permits one-hand control of several operations	MSC-30	B65-10022	05
Auxiliary silver electrode eliminates two-step voltage discharge characteristic of silver-zinc cells	GSFC-169	B64-10114	01	Digital system accurately controls velocity of electromechanical drive	GSFC-287	B65-10096	01
Modification increases light output of injection-luminescent diodes	M-FS-192	B65-10006	01	Device measures fluid drag on test vehicles	LANGLEY-34	B65-10195	01
Improved conductive paste secures biomedical electrodes	MSC-107	B65-10015	03	<b>ELECTROMETER</b>			
Didymium compound improves nickel-cadmium cell	GSFC-295	B65-10083	03	Field-effect transistor improves electrometer amplifier	ARC-36	B64-10143	01
Spherical electrode eliminates high-voltage breakdown	LEWIS-155	B65-10139	01	Vibrating-membrane electrometer has high conversion gain	ARC-38	B65-10056	01
Electrostatically driven dynamic capacitor employs capacitive feedback	JPL-771	B65-10293	01	Simplified electrometer has excellent operating characteristics	JPL-413	B65-10125	01
Rugged pressed disk electrode has low contact potential	MSC-158	B65-10320	01	Sensitive electrometer features digital output	GSFC-288	B65-10206	01
Photosensors used to maintain welding electrode-to-joint alignment	MSC-243	B65-10401	05	Electrometer has automatic zero bias control	GSFC-350	B65-10242	01
<b>ELECTRODEPOSITION</b>				Electrometer preamplifier has drift correction feedback	JPL-SC-074	B65-10267	01
Fresnel zone plate forms images at wavelengths below 1000 angstroms	GSFC-231	B65-10171	02	Electrostatically driven dynamic capacitor employs capacitive feedback	JPL-771	B65-10293	01
<b>ELECTRODERMAL RESPONSE</b>				<b>ELECTROMOTIVE FORCE</b>			
Improved conductive paste secures biomedical electrodes	MSC-107	B65-10015	03	Metal sheath improves thermocouple using graphite in one leg	NU-0011	B65-10051	01
<b>ELECTROFORMING</b>				<b>ELECTROMYOGRAM</b>			
Nickel solution prepared for precision electroforming	WOO-070	B65-10303	03	Tiny biomedical amplifier combines high performance, low power drain	ARC-41	B65-10203	01
<b>ELECTROLYTIC MACHINING</b>				<b>ELECTRON BEAM</b>			
Improved technique for localizing electro-polishing features novel nozzles	WOO-101	B64-10271	01	Tantalum cathode improves electron-beam evaporation of tantalum	JPL-WOO-021	B65-10175	03
<b>ELECTROMAGNET</b>				Electron-beam deflection controlled by digital signals	GSFC-385	B65-10283	02
Magnetic field controls carbon arc tail flame	MSC-139	B65-10108	01	<b>ELECTRON BOMBARDMENT</b>			
<b>ELECTROMAGNETIC CONTROL</b>				Multiple element soft X-ray source produces wide range of radiation	GSFC-286	B65-10082	02
Device calibrates vibration transducers at amplitudes up to 20 G.	M-FS-86	B63-10572	01	Electron bombardment improves vacuum chamber efficiency	LEWIS-160	B65-10280	02
<b>ELECTROMAGNETIC INSTRUMENT</b>				<b>ELECTRON DENSITY</b>			
Electromagnetic hammer removes weld distortions from aluminum tanks	M-FS-287	B65-10342	05	Microwave technique measures plasma characteristics	LANGLEY-134	B65-10122	02
<b>ELECTROMAGNETIC MEASUREMENT</b>				<b>ELECTRON ENERGY</b>			
Meter accurately measures flow of low-conductivity fluids	JPL-0021	B63-10280	01	Multiaxial analyzer detects low-energy electrons	GSFC-329	B65-10213	01
<b>ELECTROMAGNETIC SHIELDING</b>				<b>ELECTRON FLUX</b>			
Transducer measures temperature differentials in presence of strong electromagnetic fields	ARC-27	B65-10089	01	Multiaxial analyzer detects low-energy electrons	GSFC-329	B65-10213	01
<b>ELECTROMECHANICAL DEVICE</b>				<b>ELECTRON GUN</b>			
Stepping switch with simple actuator provides many contacts in small space	JPL-122	B63-10118	01	Electron bombardment improves vacuum chamber efficiency			

SUBJECT INDEX

LEWIS-160	B65-10280	02	Handtool facilitates extraction of circuit modules		
<b>ELECTRON MULTIPLIER</b>			LANGLEY-38	B65-10231	05
Multiaxial analyzer detects low-energy electrons			<b>ELECTRONIC STRUCTURE</b>		
GSFC-329	B65-10213	01	Screening technique makes reliable bond at room temperature		
<b>ELECTRON TUBE</b>			M-FS-227	B65-10004	03
Wire winding increases lifetime of oxide-coated cathodes			<b>ELECTROPLATING</b>		
LEWIS-154	B65-10032	03	High purity electroforming yields superior metal models		
Brushless DC motor uses electron beam switching tube as commutator			ARC-6	B63-10007	05
GSFC-345	B65-10237	01	Ellipsoidal optical reflectors reproduced by electroforming		
Titanium diaphragm makes excellent amplatron cathode support			GSFC-92	B63-10547	05
GSFC-394	B65-10298	01	Metals plated on fluorocarbon polymers		
<b>ELECTRONIC EQUIPMENT</b>			JPL-544	B63-10612	03
Electronic assembly rack panels snap on and off			Nickel/tin coating protects threaded fasteners in corrosive environment		
GSFC-59	B64-10121	05	MSC-253	B65-10398	03
Wire mesh isolator protects sensitive electronic components			<b>ELECTROSTATIC CHARGING</b>		
GSFC-347	B65-10216	05	Vibrating diaphragm measures high electrostatic field strengths		
Electronic ohmmeter provides direct digital output			MSC-189	B65-10352	01
GSFC-363	B65-10274	01	<b>ELECTROSTATIC SHIELDING</b>		
Electron-beam deflection controlled by digital signals			Improved magnetometer uses toroidal gating coil		
GSFC-385	B65-10283	02	GSFC-249	B65-10103	01
Boron nitride housing cools transistors			<b>ELLIPSOID</b>		
WOO-079	B65-10289	01	Fresnel cup reflector directs maximum energy from light source		
Thin-film resistors used in functional electronic blocks			JPL-424	B63-10263	03
GSFC-380	B65-10305	01	<b>EMBRITTLMENT</b>		
Standoff tool speeds placement of friction-fit electrical terminals			New alloy brazes titanium to stainless steel		
WOO-029	B65-10348	05	MSC-102	B65-10060	05
Multiphase clock-pulse generator uses simplified circuitry			<b>EMISSION</b>		
M-FS-297	B65-10353	01	Emission tester for high-power vacuum tubes		
Blood-pressure measuring system gives accurate graphic output			JPL-628	B64-10158	01
MSC-191	B65-10365	01	<b>EMITTER</b>		
Insulator-holder protects transistors in dense electronic assemblies			Two-stage emitter follower is temperature stabilized		
MSC-214	B65-10389	01	MSC-20	B63-10493	01
Adhesive-backed terminal board eliminates mounting screws			<b>ENCAPSULATION</b>		
MSC-173	B65-10396	01	Connector for thermocouple leads saves costly wire, makes reliable connectors		
<b>ELECTRONIC EQUIPMENT TESTING</b>			LANGLEY-26	B63-10529	01
Probe tests microweld strength			Plastic molds reduce cost of encapsulating electric cable connectors		
WOO-118	B65-10111	05	M-FS-69	B63-10568	05
Piezoresistive gage tests pin-connector sockets			Encapsulation process sterilizes and preserves surgical instruments		
JPL-675	B65-10128	01	JPL-484	B64-10066	05
Novel probe simplifies electronic component testing			<b>ENCODER</b>		
GSFC-342	B65-10243	01	Variable word length encoder reduces TV bandwidth requirements		
<b>ELECTRONIC INSPECTION DEVICE</b>			LANGLEY-87	B65-10345	01
Continuity tester screens out faulty socket connections			<b>ENERGY</b>		
JPL-596	B64-10065	01	Fresnel cup reflector directs maximum energy from light source		
<b>ELECTRONIC MODULE</b>			JPL-424	B63-10263	03
Use of tear ring permits repair of sealed module circuitry			Regenerative fuel cell combines high efficiency with low cost		
M-FS-210	B65-10014	05	WOO-090	B65-10363	01
Electronic modules easily separated from heat sink			<b>ENERGY ABSORPTION</b>		
MSC-142	B65-10186	02	Frictional wedge shock mount is inexpensive, has good damping characteristics		
			JPL-IT-1001	B63-10289	05
			Kinetic-energy absorber employs frictional force between mating cylinders		
			LEWIS-75	B63-10442	05

SUBJECT INDEX

<b>ENERGY CONVERSION</b>			JPL-544	B63-10612	03
Laser beam transmits electric power					
GSFC-293	B65-10158	01	Electroless nickel resist used in alkali-etching of aluminum	B65-10162	03
<b>ENERGY DISSIPATION</b>			GSFC-284		
Break-up of metal tube makes one-time shock absorber, bars rebound			Fresnel zone plate forms images at wavelengths below 1000 angstroms	B65-10171	02
LANGLEY-1A	B63-10304	05	GSFC-231		
<b>ENERGY SOURCE</b>			<b>ETHER</b>		
Closed fluid system without moving parts controls temperature			Test monkeys anesthetized by routine procedure	B65-10332	04
LEWIS-222	B65-10331	02	HQ-18		
<b>ENGINE</b>			<b>ETHYLENE OXIDE</b>		
Self-balancing beam permits safe, easy load handling under overhang			Encapsulation process sterilizes and preserves surgical instruments	B64-10066	05
M-FS-84	B63-10571	05	JPL-484		
<b>ENGINEERING DEVELOPMENT</b>			<b>EUTECTIC ALLOY</b>		
Modified contour projector makes excellent contour densitometer			Coating method enables low-temperature brazing of stainless steel	B65-10250	03
LANGLEY-93	B65-10084	02	NU-0030		
<b>ENVIRONMENT</b>			<b>EVAPORATION</b>		
Gallium useful bearing lubricant in high-vacuum environment			Tantalum cathode improves electron-beam evaporation of tantalum	B65-10175	03
LEWIS-12	B63-10337	03	JPL-W00-021		
Improved molybdenum disulfide-silver motor brushes have extended life			<b>EXHAUST</b>		
M-FS-64	B63-10479	03	Refractory thermal insulation for smooth metal surfaces	B64-10099	03
Miniature servo accelerometer is force-balanced			M-FS-160		
JPL-155	B65-10340	01	Magnetic field controls carbon arc tail flame	B65-10108	01
<b>ENVIRONMENTAL CHAMBER</b>			MSC-139		
Double gloves reduce contamination of dry box atmosphere			<b>EXHAUST GAS</b>		
LEWIS-211	B65-10117	03	Plastic bags in evacuated chamber make lightweight gas sampling system	B65-10264	01
<b>ENVIRONMENTAL TESTING</b>			FRC-31		
System transmits mechanical vibration into hazardous environment			<b>EXHAUST JET</b>		
NU-0025	B65-10248	05	Probe samples components of rocket engine exhaust	B65-10384	03
Multiple test chamber exposes materials to various environments			M-FS-485		
MSC-179	B65-10268	01	<b>EXOTHERMIC REACTION</b>		
<b>EPOXIDE</b>			Nitrogen dioxide produced by self-sustained pyrolysis of nitrous oxide	B65-10074	05
Integral coolant channels simply made by melt-out method			LANGLEY-32		
M-FS-91	B63-10497	05	<b>EXPANDABLE STRUCTURE</b>		
<b>EPOXY RESIN</b>			Collapsible truss structure is automatically expandable	B65-10126	05
Integral coolant channels simply made by melt-out method			GSFC-265		
M-FS-91	B63-10497	05	<b>EXPIRATION</b>		
Stringent cleaning technique assures reliable epoxy bond			Device induces lungs to maintain known constant pressure	B64-10108	04
GSFC-161	B64-10142	03	MSC-50		
Screening technique makes reliable bond at room temperature			<b>EXPLOSIVE</b>		
M-FS-227	B65-10004	03	Explosives actuate nonmagnetic indexing device	B65-10017	05
Aluminum alloys protected against stress-corrosion cracking			GSFC-237		
M-FS-235	B65-10172	03	<b>EXPLOSIVE DEVICE</b>		
Epoxy-resin patterns speed shell-molding of aluminum parts			Splice plate design assures structural separation by mild explosive	B65-10166	05
M-FS-303	B65-10177	05	MSC-137		
<b>EQUILIBRIUM FLOW</b>			Threaded split ring connector separates structural sections	B65-10383	05
Averaging probe reduces static-pressure sensing errors			LANGLEY-145		
LANGLEY-36	B65-10114	05	<b>EXPLOSIVE FORMING</b>		
<b>ERROR SIGNAL</b>			Metal parts hydrosized by explosive force	B65-10170	05
Circuit detects errors in address currents for magnetic core arrays			M-FS-289		
M-FS-234	B65-10047	01	<b>EXPOSURE</b>		
<b>ETCHING</b>			Electromechanically operated camera shutter provides uniform exposure	B63-10227	01
Metals plated on fluorocarbon polymers			JPL-357		
			<b>EXTRUSION</b>		
			Rapid billet loader aids extrusion of refractory metals	B63-10354	05
			LEWIS-50		

SUBJECT INDEX

Guide for extrusion dies eliminates straightening operation LEWIS-152	B64-10014	05	M-FS-257	B65-10129	02
Integral ribs formed in metal panels by cold-press extrusion M-FS-230	B65-10141	05	<b>FEEDBACK</b> Electrostatically driven dynamic capacitor employs capacitive feedback JPL-771	B65-10293	01
<b>EYE MOVEMENT</b> Photoelectric sensor output controlled by eyeball movements M-FS-274	B65-10079	01	<b>FEEDBACK AMPLIFIER</b> Voltage variable oscillator has high phase stability LANGLEY-123	B65-10204	01
<b>F</b>			<b>FEEDBACK CONTROL SYSTEM</b> Apparatus measures very small thrusts WOO-048	B64-10284	05
<b>FAIRING</b> Pressure transducer 3/8-inch in size can be faired into surface WOO-065	B64-10021	05	Feedback oscillator functions as low-level pulse stretcher GSFC-261	B65-10069	01
<b>FASTENER</b> V-slotted screw head and matching driving tool facilitate insertion and removal of screw fasteners FRC-16	B63-10023	05	Noncontacting vibration transducer has constant sensitivity LANGLEY-99	B65-10392	01
Heavy-duty staple remover operated by hand JPL-IT-1004	B63-10292	05	<b>FEEDING DEVICE</b> Tension is servo controlled in film advance system LANGLEY-54	B65-10075	05
Buckle joins web straps quickly, adjusts easily LANGLEY-21	B64-10119	05	<b>FERRITE</b> Small digital recording head has parallel bit channels, minimizes cross talk JPL-0029	B63-10284	01
Electronic assembly rack panels snap on and off GSFC-59	B64-10121	05	New sintering process adjusts magnetic value of ferrite cores GSFC-129	B63-10606	01
Flexible fastener allows thermal expansion LANGLEY-40	B64-10145	05	Molded elastomer provides compact ferrite-core holder, simplifies assembly JPL-584	B64-10084	05
Threading hook facilitates safe recovery of heavy loads MSC-46	B64-10185	05	<b>FIBER</b> Plastic plus stainless-steel fibers make resilient, impermeable material WOO-246	B65-10374	03
Fastener provides cooling and compensates for thermal expansion NU-0003	B65-10038	05	<b>FIELD EFFECT TRANSISTOR /FET/</b> Field-effect transistor improves electrometer amplifier ARC-36	B64-10143	01
Low-cost tool minimizes damage to O-rings during installation MSC-140	B65-10116	05	Field effect transistors used as voltage-controlled resistors M-FS-174	B64-10163	01
Coiled spring makes self-locking device for threaded fasteners MSC-149	B65-10135	05	Logarithmic amplifier uses field effect transistors JPL-509	B65-10145	01
Galvanic corrosion reduced in aluminum fabrications M-FS-272	B65-10140	03	Field effect transistor presents high input impedance in AC amplifier JPL-500	B65-10232	01
Captive nut fastener securely joins brittle materials NU-0008	B65-10245	05	Field-effect transistor replaces bulky transformer in analog-gate circuit GSFC-351	B65-10284	01
Burnishing technique improves lubrication of threaded fasteners LEWIS-217	B65-10302	03	<b>FILAMENT</b> Radiant heater for vacuum furnaces offers high structural rigidity, low heat loss LEWIS-39	B63-10342	01
Fastener distributes stress evenly from sandwich-panel-hung items MSC-236	B65-10358	05	<b>FILAMENT WINDING</b> Fiberglass parts cured during filament winding eliminates oven, saves time M-FS-14	B65-10088	03
Nickel/tin coating protects threaded fasteners in corrosive environment MSC-253	B65-10398	03	<b>FILM</b> Tension is servo controlled in film advance system LANGLEY-54	B65-10075	05
<b>FATIGUE</b> Apparatus facilitates pressure-testing of metal tubing LEWIS-174	B65-10131	05	System selects framing rate for spectrograph camera LANGLEY-55	B65-10086	01
<b>FATIGUE LIFE</b> Control of component differential hardness increases bearing life LEWIS-190	B65-10251	05	<b>FILTER</b> Modified filter prevents conduction of micro-		
<b>FATIGUE TESTING MACHINE</b> Apparatus permits flexure testing of specimens at cryogenic temperatures					



SUBJECT INDEX

controls temperature LEWIS-222	B65-10331	02	Light ray modulation controls optical system alignment GFSC-171	B65-10211	02
Magnetic fluid readily controlled in zero gravity environment LEWIS-126	B65-10335	03	<b>FOIL</b> Indium foil with beryllia washer improves transistor heat dissipation GSFC-42	B63-10033	01
Binary counter uses fluid logic elements M-FS-323	B65-10377	01	Ceramic-coated boat is chemically inert, provides good heat transfer LANGLEY-90	B65-10063	05
Three-dimensional wire-mesh capacitor system measures fluid density WOO-194	B65-10379	01	<b>FORCE</b> System measures unidirectional forces, excludes extraneous forces LEWIS-170	B65-10154	05
Electrically heated diaphragm eliminates use of pyrotechnics MSC-241	B65-10400	01	<b>FORGING</b> Upsetting butt edge increases weld-joint strength M-FS-175	B64-10164	05
<b>FLUID POWER</b> Fluid-pressure measurement apparatus uses short-length manometer tubes LEWIS-28	B65-10027	05	<b>FORMING</b> Angular glass tubing drawn from round tubing HQ-20	B65-10235	05
<b>FLUID SWITCHING ELEMENT</b> Liquid switch is remotely operated by low DC voltage GSFC-119	B63-10599	01	<b>FRACTURE</b> Pressure molding of powdered materials improved by rubber mold insert WOO-100	B64-10270	03
<b>FLUID TRANSMISSION LINE</b> Safety restrainer prevents whipping of ruptured high-pressure hose LEWIS-99	B64-10348	05	<b>FRAGMENTATION</b> Break-up of metal tube makes one-time shock absorber, bars rebound LANGLEY-1A	B63-10304	05
<b>FLUORESCENCE</b> Oil-smeared models aid wind tunnel measurements LANGLEY-4	B63-10311	03	<b>FRAME</b> Apparatus alters position of objects to facilitate demagnetization GSFC-234	B64-10277	05
Distant objects detected visually with optical filters LANGLEY-166	B65-10252	02	Simple circuit positions film frames in projector JPL-508	B65-10132	02
<b>FLUORO COMPOUND</b> Organic reactants rapidly produce plastic foam LANGLEY-37	B65-10288	03	<b>FREE STREAM</b> Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114	05
<b>FLUOROCARBON</b> Metals plated on fluorocarbon polymers JPL-544	B63-10612	03	<b>FREQUENCY</b> Voltage generator sweeps oscillator frequency linearly with time M-FS-219	B64-10320	01
Low-cost seal compensates for surface irregularities NU-0016	B65-10160	05	<b>FREQUENCY CONTROL</b> Transistorized trigger circuit is frequency- controllable GSFC-111	B63-10553	01
Electronic modules easily separated from heat sink MSC-142	B65-10186	02	FM oscillator uses tetrode transistor JPL-82	B65-10055	01
<b>FLUX</b> Improved magnetometer uses toroidal gating coil GSFC-249	B65-10103	01	Variable frequency transistor inverters use multiple core transformers GSFC-183	B65-10119	01
<b>FLUX DENSITY</b> Shaped superconductor cylinder retains intense magnetic field JPL-381	B63-10238	01	Frequency offset in linear FM/CW transponder eliminates clutter M-FS-249	B65-10146	01
Computer programs simplify optical system analysis GSFC-306	B65-10093	01	Frequency correction device uses digital circuitry GSFC-268	B65-10307	01
<b>FOAM</b> Organic reactants rapidly produce plastic foam LANGLEY-37	B65-10288	03	<b>FREQUENCY CONVERSION</b> Frequency-shift-keyer circuit improves PCM conversion for radio transmission GSFC-80	B63-10511	01
<b>FOAMED MATERIAL</b> Compact assembly generates plastic foam, inflates flotation bag LANGLEY-96	B65-10090	05	Electronic ampere-hour integrator is accurate to one percent GSFC-203	B65-10308	01
Soluble undercoating facilitates removal of foamed-in-place insulation LEWIS-193	B65-10344	03	Frequency discriminator with binary output eliminates tuned circuits		
<b>FOCUS</b> Fresnel cup reflector directs maximum energy from light source JPL-424	B63-10263	03			

SUBJECT INDEX

M-FS-376	B65-10349	01	ible drive ARC-8	B63-10009	05
<b>FREQUENCY CONVERTER</b>					
Circuit converts AM signals to FM for magnetic recording GSFC-227	B65-10001	01	Kinetic-energy absorber employs frictional force between mating cylinders LEWIS-75	B63-10442	05
Traveling-wave tube circuit simplifies microwave relay GSFC-299	B65-10127	01	Gate valve with ceramic-coated base operates at high temperatures ARC-23	B63-10562	03
<b>FREQUENCY DIVIDER</b>					
Unijunction frequency divider is free of backward loading JPL-W00-010	B65-10112	01	Buckle joins web straps quickly, adjusts easily LANGLEY-21	B64-10119	05
Frequency divider is free of spurious outputs GSFC-308	B65-10334	01	<b>FUEL CELL</b> Fuel cell serves as oxygen level detector JPL-SC-072	B65-10066	01
<b>FREQUENCY MEASUREMENT</b>					
Small foamed polystyrene shield protects low-frequency microphones from wind noise M-FS-123	B63-10579	01	Regenerative fuel cell combines high efficiency with low cost W00-090	B65-10363	01
Nonresonant support facilitates vibration testing of structures M-FS-224	B65-10039	05	<b>FUNCTION GENERATOR</b> Zener diode function generator requires no external reference voltage JPL-33	B65-10013	01
<b>FREQUENCY MODULATION</b>					
Tunnel-diode circuit features zero-level clipping GSFC-241	B65-10002	01	<b>FURNACE</b> Radiant heater for vacuum furnaces offers high structural rigidity, low heat loss LEWIS-39	B63-10342	01
Voltage variable oscillator has high phase stability LANGLEY-123	B65-10204	01	Rapid billet loader aids extrusion of refractory metals LEWIS-50	B63-10354	05
FM/CW system measures aircraft attitude M-FS-276	B65-10290	01	<b>FUSE</b> Splice plate design assures structural separation by mild explosive MSC-137	B65-10166	05
<b>FREQUENCY MULTIPLIER</b>					
Phase detector circuit synthesizes own reference signal M-FS-247	B65-10080	01	Cam-operated limit switch features safe fuse replacement MSC-218	B65-10322	01
<b>FREQUENCY RANGE</b>					
Increased performance reliability obtained with dual /redundant/ oscillator system GSFC-36	B63-10027	01	<b>FUSION</b> Circuit reliability boosted by soldering pins of disconnect plugs to sockets JPL-447	B64-10002	01
Photoresistance analog multiplier has wide range GSFC-360	B65-10287	01			
<b>FREQUENCY REGULATOR</b>					
Hybrid circuit achieves pulse regeneration with low power drain GSFC-382	B65-10314	01			
<b>FREQUENCY RESPONSE</b>					
Simple device produces accelerometer calibration pulse M-FS-363	B65-10269	01			
Device detects unbonded areas in plastic laminates W00-206	B65-10380	01			
<b>FREQUENCY-SHIFT KEYING</b>					
Frequency-shift-keyer circuit improves PCM conversion for radio transmission GSFC-80	B63-10511	01			
<b>FREQUENCY SYNTHESIS</b>					
Phase shift frequency synthesizer is efficient, small in size M-FS-250	B65-10169	01			
<b>FRESNEL REFLECTOR</b>					
Fresnel cup reflector directs maximum energy from light source JPL-424	B63-10263	03			
Wide-aperture solar energy collector is light in weight JPL-SC-055	B65-10046	02			
<b>FRICTION</b>					
Chain friction system gives positive, revers-					

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<b>GALLIUM</b>					
Gallium useful bearing lubricant in high-vacuum environment LEWIS-12	B63-10337	03			
<b>GALLIUM ARSENIDE</b>					
New method used to fabricate gallium arsenide photovoltaic device W00-062	B64-10019	01			
Economical fabrication process produces high-quality junction transistors JPL-SC-065	B64-10330	01			
Thermocompression bonding produces efficient surface-barrier diode JPL-SC-066	B65-10007	05			
Laser beam transmits electric power GSFC-293	B65-10158	01			
<b>GALVANOMETER</b>					
Light-sensitive potentiometer measures product of two variables GSFC-240	B65-10076	01			
<b>GAP</b>					
Shrinkable sleeve eliminates shielding gap in RF cable W00-207	B65-10387	01			
<b>GAS</b>					
Filter for high-pressure gases has easy take-down, assembly JPL-373	B63-10234	03			

**SUBJECT INDEX**

Pulsed plasma accelerator operates repetitively without complex controls LANGLEY-48	B65-10062	01	<b>GASKET</b> Flexible plastic ring assembly makes durable shaft seal W00-227	B65-10367	05
Inert gas spraying device aids in repair of hazardous systems LEWIS-8B	B65-10115	05	<b>GASOLINE</b> Inert gas spraying device aids in repair of hazardous systems LEWIS-8B	B65-10115	05
<b>GAS ANALYZER</b> Rapid helium-air analyzer can measure other binary gas mixtures LANGLEY-16	B63-10557	03	<b>GAUGE</b> Level of super-cold liquids automatically maintained by levelometer JPL-397	B63-10250	01
<b>GAS BEARING</b> Elastic orifice automatically regulates gas bearings JPL-135	B63-10123	05	<b>GEAR</b> Chain friction system gives positive, reversible drive ARC-8	B63-10009	05
Modified gas bearing is adjustable to optimum stiffness ratio M-FS-145	B64-10050	05	Shock absorber protects motive components against overloads W00-092	B65-10008	05
Pneumatic power is transmitted through air bearing MSC-8	B64-10141	05	Bidirectional torque filter eliminates backlash GSFC-335	B65-10148	05
<b>GAS COOLING SYSTEM</b> High-temperature, high-pressure spherical segment valve provides quick opening ARC-13	B63-10431	05	Unique gear design provides self-lubrication JPL-SC-079	B65-10366	03
<b>GAS EVOLUTION</b> Plated nickel wire mesh makes superior catalyst bed MSC-216	B65-10321	03	<b>GEAR TOOTH</b> Device measures curved surface finish on gear teeth W00-112	B65-10064	05
<b>GAS FLOW</b> High-pressure regulating system prevents pressure surges JPL-231	B63-10170	05	Unique gear design provides self-lubrication JPL-SC-079	B65-10366	03
Blade valve isolates compartment in pipe, opens to allow free flow JPL-585	B64-10188	05	<b>GENERATOR</b> Binary system generates sidereal rate from standard solar rate GSFC-190	B64-10200	01
Instrument calibrates low gas-rate flowmeters MSC-134	B65-10137	01	Voltage generator sweeps oscillator frequency linearly with time M-FS-219	B64-10320	01
<b>GAS LUBRICATED BEARING</b> Slit feeds reduce unbalanced torques in gas-lubricated bearings JPL-264	B65-10099	05	<b>GEOGRAPHY</b> Density trace made with computer printout GSFC-322	B65-10200	01
<b>GAS MIXTURE</b> Rapid helium-air analyzer can measure other binary gas mixtures LANGLEY-16	B63-10557	03	<b>GIMBAL</b> Ball-and socket joints provide accurate biaxial gimbal JPL-658	B65-10205	05
<b>GAS PRESSURE</b> Precision gage measures ultrahigh vacuum levels GSFC-114	B63-10597	01	<b>GLASS</b> IR-transmission glasses formed from oxides of bismuth and tellurium M-FS-279	B65-10190	03
Device induces lungs to maintain known constant pressure MSC-50	B64-10108	04	Thin transparent films formed from powdered glass GSFC-352	B65-10217	03
<b>GAS STREAM</b> Apparatus measures concentration of suspended droplets in gas streams LANGLEY-31	B64-10237	01	Angular glass tubing drawn from round tubing HQ-20	B65-10235	05
Probe measures characteristics of hot gas stream M-FS-240	B65-10133	02	Porous glass makes effective substrate for ozone-sensing reagent GSFC-388	B65-10364	03
Instrument calibrates low gas-rate flowmeters MSC-134	B65-10137	01	<b>GLASS FIBER</b> Flexible curtain shields equipment from intense heat fluxes M-FS-48	B65-10044	03
Internal cooling increases range of immersion-type temperature probe LEWIS-171	B65-10157	02	Fiberglass parts cured during filament winding eliminates oven, saves time M-FS-14	B65-10088	03
<b>GASEOUS DIFFUSION</b> Impurity diffusion process for silicon semiconductors is fast and precise GSFC-397	B65-10300	01	Fiberglass dies speed forming of large metal sheets M-FS-214	B65-10210	05
			<b>GOLD ALLOY</b> Thermocompression bonding produces efficient surface-barrier diode		

SUBJECT INDEX

JPL-SC-066	B65-10007	05	LANGLEY-6A	B63-10318	03
<b>GRAPH</b>			<b>GYROSCOPE</b>		
Simple scale interpolator facilitates reading of graphs LANGLEY-88	B65-10070	05	Slit feeds reduce unbalanced torques in gas-lubricated bearings JPL-264	B65-10099	05
Blood-pressure measuring system gives accurate graphic output MSC-191	B65-10365	01	<b>H</b>		
<b>GRAPHIC ARTS</b>			<b>HAND</b>		
Disk calculator indicates legible lettering size for slide projection GSFC-409	B65-10339	05	Standoff tool speeds placement of friction-fit electrical terminals WOO-029	B65-10348	05
Modified procedure speeds camera copy layout for offset printing GSFC-424	B65-10373	02	<b>HANDLING EQUIPMENT</b>		
<b>GRAPHITE</b>			Filler device for handling hot corrosive materials MSC-85	B64-10166	03
Metal sheath improves thermocouple using graphite in one leg NU-0011	B65-10051	01	Remotely operated clamping tool has positive grip NU-0020	B65-10254	05
Graphite element serves as radiant heat source M-FS-105	B65-10218	01	Hollow plastic hoops protect thermocouple in storage and handling NU-0023	B65-10256	05
<b>GRATING</b>			<b>HARDENING</b>		
Simple optical system used to align spectrograph LANGLEY-92	B65-10071	02	Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application LANGLEY-6A	B63-10318	03
<b>GRAVITATIONAL EFFECT</b>			Stringent cleaning technique assures reliable epoxy bond GSFC-161	B64-10142	03
Technique simulates effect of reduced gravity LANGLEY-44	B64-10146	04	<b>HAZARD</b>		
<b>GRAVITY</b>			Low-cost insulation system for cryostats eliminates need for a vacuum LEWIS-64	B63-10365	03
Miniature servo accelerometer is force-balanced JPL-155	B65-10340	01	<b>HEART RATE</b>		
<b>GREASE</b>			Digital cardiometer computes and displays heartbeat rate MSC-93	B64-10258	01
Lightweight load support serves as vibration damper JPL-661	B65-10144	05	Inexpensive, stable circuit measures heart rate MSC-95	B65-10010	01
Electronic modules easily separated from heat sink MSC-142	B65-10186	02	Digital-output cardiometer measures rapid changes in heartbeat rate MSC-133	B65-10143	01
<b>GRID</b>			<b>HEAT CONTENT</b>		
Fine-mesh screen made by simplified method WOO-104	B64-10282	03	Probe measures characteristics of hot gas stream M-FS-240	B65-10133	02
Radiation detector-optical hanging device is of simplified construction GSFC-251	B64-10299	01	<b>HEAT DISSIPATION</b>		
Forming blocks speed production of strain gage grids LEWIS-182	B65-10009	05	Indium foil with beryllia washer improves transistor heat dissipation GSFC-42	B63-10033	01
Wire bundle formed into grids with minute interstices WOO-089	B65-10372	03	<b>HEAT EXCHANGER</b>		
<b>GRINDING MACHINE</b>			Cantilever springs maintain tension in thermally expanded wires LEWIS-136	B65-10149	05
Lathe converted for grinding aspheric surfaces GSFC-115	B63-10556	05	Spiraled channels improve heat transfer between fluids JPL-694	B65-10291	02
Rotating holder permits accurate grinding of metallurgical microsamples LEWIS-131	B65-10262	05	<b>HEAT FLUX</b>		
<b>GROOVE</b>			Graphite element serves as radiant heat source M-FS-105	B65-10218	01
New package for Belleville spring permits rate change, easy disassembly JPL-392	B63-10247	05	Air-cured ceramic coating insulates against high heat fluxes M-FS-150	B65-10357	03
<b>GROUND RESONANCE</b>			<b>HEAT RESISTANCE</b>		
Flange on microwave antenna subreflector cuts ground noise JPL-362	B63-10229	01	Removable preheater elements improve oxide induction furnace JPL-288	B63-10193	01
<b>GUN</b>			Thermally conductive metal wool-silicone rubber material can be used as shock and		
Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application					

SUBJECT INDEX

vibration damper JPL-321	B63-10207	03	Wire winding increases lifetime of oxide-coated cathodes LEWIS-154	B65-10032	03
<b>HEAT SHIELD</b> New method forms bond line free of voids LANGLEY-20	B63-10558	05	Efficient thin film heating element takes minimum space GSFC-289	B65-10123	01
Refractory thermal insulation for smooth metal surfaces M-FS-160	B64-10099	03	Cantilever springs maintain tension in thermally expanded wires LEWIS-136	B65-10149	05
<b>HEAT SINK</b> Indium foil with beryllia washer improves transistor heat dissipation GSFC-42	B63-10033	01	Heater decomposes oil backstreaming from high-vacuum pumps GSFC-356	B65-10224	02
Mounting for diodes provides efficient heat sink M-FS-197	B64-10283	01	<b>HEATING</b> Integral coolant channels simply made by melt-out method M-FS-91	B63-10497	05
Automatic thermal switch accelerates cooling-down of cryogenic system JPL-655	B65-10068	01	<b>HEATING EQUIPMENT</b> Refractory metal shielding /insulation/ increases operating range of induction furnace LEWIS-202	B65-10188	02
Refractory oxides evaluated for high-temperature use LANGLEY-121	B65-10167	03	<b>HELICAL WINDING</b> Helical tube separates nitrogen gas from liquid nitrogen JPL-398	B63-10251	05
Electronic modules easily separated from heat sink MSC-142	B65-10186	02	Helical coaxial-resonator makes excellent RF filter GSFC-243	B65-10012	01
Wire mesh isolator protects sensitive electronic components GSFC-347	B65-10216	05	<b>HELICOPTER</b> Scoop attachment makes helicopter recoveries easier and safer MSC-130	B65-10229	05
Boron nitride housing cools transistors WOO-079	B65-10289	01	<b>HELIUM</b> Cryogenic filter method produces super-pure helium and helium isotopes JPL-374	B63-10235	03
<b>HEAT SOURCE</b> Graphite element serves as radiant heat source M-FS-105	B65-10218	01	Supercold technique duplicates magnetic field in second superconductor JPL-376	B63-10237	05
<b>HEAT TRANSFER</b> High purity electroforming yields superior metal models ARC-6	B63-10007	05	Low-cost insulation system for cryostats eliminates need for a vacuum LEWIS-64	B63-10365	03
Cooling method prolongs life of hot-wire transducer LEWIS-41	B63-10344	02	Rapid helium-air analyzer can measure other binary gas mixtures LANGLEY-16	B63-10557	03
New method used to fabricate light-weight heat exchanger for rocket motor LEWIS-43	B63-10346	02	<b>HELMET</b> Comfortable, lightweight safety helmet holds radio transmitter, receiver MSC-53	B64-10015	05
Simple transducer measures low heat-transfer rates JPL-466	B64-10122	01	<b>HEPTANE</b> Magnetic fluid readily controlled in zero gravity environment LEWIS-126	B65-10335	03
Adhesive for vacuum environments resists shock and vibration MSC-56	B65-10016	03	<b>HERMETIC SEAL</b> Device transmits rotary motion through hermetically sealed wall JPL-303	B63-10198	05
Thermistor connector assembly increases accuracy of measurements LANGLEY-62	B65-10045	01	Mouthpiece adapter for pipettes protects mouth from harmful liquids LANGLEY-47	B65-10043	03
Internal cooling increases range of immersion-type temperature probe LEWIS-171	B65-10157	02	<b>HIGH EFFICIENCY</b> Highly efficient square-wave oscillator operator at high power levels GSFC-112	B63-10554	01
Insulation accelerates rate of cooling with cryogenic fluid MSC-161	B65-10240	02	<b>HIGH FREQUENCY</b> Computer determines high-frequency phase stability GSFC-113	B63-10555	01
Vacuum chamber provides improved insulation and support for cryostat M-FS-415	B65-10368	02	Increased junction lead inductance ballasts high-frequency transistors GSFC-387	B65-10259	01
<b>HEATER</b> Apparatus facilitates high-temperature tensile testing in vacuum LEWIS-42	B63-10345	03			
Filler device for handling hot corrosive materials MSC-85	B64-10166	03			

SUBJECT INDEX

<b>HIGH POWER</b>			JPL-463	B65-10037	05
Highly efficient square-wave oscillator operator at high power levels			Carbon-arc rod holder has long life, reduces arc splatter		
GSFC-112	B63-10554	01	MSC-144	B65-10095	03
<b>HIGH PRESSURE</b>					
High-pressure regulating system prevents pressure surges			Insulator-holder protects transistors in dense electronic assemblies		
JPL-231	B63-10170	05	MSC-214	B65-10389	01
High-temperature, high-pressure spherical segment valve provides quick opening			<b>HONEYCOMB</b>		
ARC-13	B63-10431	05	Apparatus permits flexure testing of specimens at cryogenic temperatures		
Pneumatic power is transmitted through air bearing			M-FS-257	B65-10129	02
MSC-8	B64-10141	05	<b>HONEYCOMB CORE</b>		
<b>HIGH SPEED</b>			Flexible honeycomb structure can bend to fit compound curves		
Dynamometer senses depletion of lubricant in journal bearings			M-FS-13	B63-10385	05
LEWIS-37	B64-10042	01	<b>HORN ANTENNA</b>		
<b>HIGH STRENGTH ALLOY</b>			Novel horn antenna reduces side lobes, improves radiation pattern		
New cobalt alloys have high-temperature strength and long life in vacuum environments			JPL-425	B63-10264	01
LEWIS-47	B63-10351	03	<b>HOT GAS</b>		
<b>HIGH TEMPERATURE</b>			Probe measures characteristics of hot gas stream		
Radiant heater for vacuum furnaces offers high structural rigidity, low heat loss			M-FS-240	B65-10133	02
LEWIS-39	B63-10342	01	<b>HOT-WIRE ANEMOMETER</b>		
Apparatus facilitates high-temperature tensile testing in vacuum			Cooling method prolongs life of hot-wire transducer		
LEWIS-42	B63-10345	03	LEWIS-41	B63-10344	02
High-temperature, high-pressure spherical segment valve provides quick opening			<b>HUMAN BODY</b>		
ARC-13	B63-10431	05	Novel shock absorber features varying yield strengths		
Gate valve with ceramic-coated base operates at high temperatures			MSC-63A	B64-10138	03
ARC-23	B63-10562	03	<b>HUMAN REACTION</b>		
<b>HIGH TEMPERATURE ENVIRONMENT</b>			Technique simulates effect of reduced gravity		
New cobalt alloys have high-temperature strength and long life in vacuum environments			LANGLEY-44	B64-10146	04
LEWIS-47	B63-10351	03	<b>HYBRID COMPUTER</b>		
Fastener provides cooling and compensates for thermal expansion			Hybrid computer technique yields random signal probability distributions		
NU-0003	B65-10038	05	ARC-34	B65-10208	01
Refractory oxides evaluated for high-temperature use			<b>HYDRAULIC ACTUATOR</b>		
LANGLEY-121	B65-10167	03	Device disconnects several couplings simultaneously		
<b>HIGH TEMPERATURE MATERIAL</b>			JPL-226	B65-10163	05
Rapid billet loader aids extrusion of refractory metals			<b>HYDRAULIC EQUIPMENT</b>		
LEWIS-50	B63-10354	05	Upsetting butt edge increases weld-joint strength		
<b>HIGH VACUUM</b>			M-FS-175	B64-10164	05
Gallium useful bearing lubricant in high-vacuum environment			Hydraulic device provides accurate displacements to microinches		
LEWIS-12	B63-10337	03	MSC-112	B65-10230	05
Improved molybdenum disulfide-silver motor brushes have extended life			Shock absorber operates over wide range		
M-FS-64	B63-10479	03	MSC-168	B65-10241	05
Instrument accurately measures extremely low air densities			<b>HYDRAULIC SYSTEM</b>		
M-FS-193	B65-10221	01	New nut and sleeve improve flared connections		
<b>HIGH VOLTAGE</b>			M-FS-194	B65-10180	05
Modified filter prevents conduction of microwave signals along high-voltage power supply leads			Hydraulic drive system prevents backlash		
JPL-63	B63-10091	01	JPL-371	B65-10351	05
<b>HOLDER</b>			<b>HYDRAZINE</b>		
Molded elastomer provides compact ferrite-core holder, simplifies assembly			Solder flux leaves corrosion-resistant coating on metal		
JPL-584	B64-10084	05	JPL-611	B64-10206	03
Improved holder protects crystal during high acceleration and impact			<b>HYDROGEN</b>		
			Cryopumping of hydrogen in vacuum chambers is aided by catalytic oxidation of hydrogen		
			LEWIS-15	B63-10340	05
			Miniature oxygen-hydrogen cutting torch constructed from hypodermic needle		
			JPL-545	B63-10517	05
			<b>HYDROGEN PEROXIDE</b>		
			Plated nickel wire mesh makes superior		

SUBJECT INDEX

catalyst bed MSC-216	B65-10321	03	ARC-26	B64-10004	01
<b>HYDROSTATIC PRESSURE</b>			<b>IMPACT ACCELERATION</b>		
Nonresonant support facilitates vibration testing of structures			Improved holder protects crystal during high acceleration and impact		
M-FS-224	B65-10039	05	JPL-463	B65-10037	05
<b>HYSTERESIS</b>			<b>IMPACT DECELERATION</b>		
New package for belleville spring permits rate change, easy disassembly			Kinetic-energy absorber employs frictional force between mating cylinders		
JPL-392	B63-10247	05	LEWIS-75	B63-10442	05
			<b>IMPEDANCE</b>		
<b>I-BEAM</b>			High-pass RF coaxial filter rejects DC and low frequency signals		
Self-balancing beam permits safe, easy load handling under overhang			GSFC-73	B64-10173	01
M-FS-84	B63-10571	05	<b>IMPINGEMENT</b>		
<b>IGNITER</b>			Improved technique for localizing electro-polishing features novel nozzles		
Igniting system for mercury vapor lamps protects transistorized sustaining supply			WOO-101	B64-10271	01
JPL-421	B63-10262	01	<b>IMPURITY</b>		
<b>IGNITION SYSTEM</b>			Impurity diffusion process for silicon semiconductors is fast and precise		
Igniting system for mercury vapor lamps protects transistorized sustaining supply			GSFC-397	B65-10300	01
JPL-421	B63-10262	01	<b>INCLINATION</b>		
Circuit controls transients in SCR inverters			Averaging probe reduces static-pressure sensing errors		
GSFC-120	B63-10600	01	LANGLEY-36	B65-10114	05
Carbon arc ignition improved by simple auxiliary circuit			<b>INDICATOR</b>		
MSC-103	B65-10018	01	Speed-sensing device aids crane operators		
<b>IGNITRON</b>			WS-4	B64-10006	05
Compact SCR trigger circuit for ignitron switch operates efficiently			Coaxial capacitor used to determine fluid density		
M-FS-371	B65-10347	01	LEWIS-232	B65-10296	02
<b>ILLUMINATION</b>			Test strips detect different CO2 concentrations in closed compartments		
New low-level AC amplifier provides adjustable noise cancellation and automatic temperature compensation			MSC-210	B65-10390	03
MSC-108	B65-10003	05	<b>INDIUM</b>		
<b>IMAGE</b>			Indium foil with beryllia washer improves transistor heat dissipation		
Setting of angles on machine tools speeded by magnetic protractor			GSFC-42	B63-10033	01
ARC-5	B63-10006	01	<b>INDUCTANCE</b>		
Built-in templates speed up process for making accurate models			Simple circuit produces high-speed, fixed duration pulses		
LANGLEY-23	B63-10526	05	GSFC-285	B65-10228	01
Fresnel zone plate forms images at wavelengths below 1000 angstroms			Increased junction lead inductance ballasts high-frequency transistors		
GSFC-231	B65-10171	02	GSFC-387	B65-10259	01
<b>IMAGE CONVERTER</b>			<b>INDUCTION HEATING EQUIPMENT</b>		
Electron-beam deflection controlled by digital signals			Removable preheater elements improve oxide induction furnace		
GSFC-385	B65-10283	02	JPL-288	B63-10193	01
<b>IMAGE TRANSDUCER</b>			Refractory metal shielding /insulation/ increases operating range of induction furnace		
Cesium iodide crystals fused to vacuum tube faceplates			LEWIS-202	B65-10188	02
GSFC-67	B63-10476	03	<b>INDUCTOR</b>		
<b>IMAGING TECHNIQUE</b>			Inductor flyback characteristic gives voltage regulator fast response		
Electromechanically operated camera shutter provides uniform exposure			GSFC-361	B65-10257	01
JPL-357	B63-10227	01	<b>INERT ATMOSPHERE</b>		
<b>IMBEDDING</b>			Thoriated nickel bonded by solid-state diffusion method		
Pressure transducer 3/8-inch in size can be faired into surface			LANGLEY-116	B65-10220	03
WOO-065	B64-10021	05	Refractory metals welded or brazed with tungsten inert gas equipment		
<b>IMMERSION</b>			LEWIS-219	B65-10319	05
Wedge immersed thermistor bolometer measures infrared radiation			Inert-gas welding and brazing enclosure fabricated from sheet plastic		
GSFC-443	B65-10330	02	LEWIS-220	B65-10338	05
<b>IMPACT</b>			<b>INERT GAS</b>		
Ultra-sensitive transducer advances micro-measurement range			Novel clamps align large rocket cases, eliminate back-up bars		
			M-FS-1	B63-10376	05

SUBJECT INDEX

Welding procedure improves quality of welds, offers other advantages M-FS-32	B64-10309	01	Transistor voltage comparator performs own sensing GSFC-228	B65-10028	01
<b>INERTIA MOMENT</b> Device enables measurement of moments of inertia about three axes GSFC-49	B65-10176	05	Photoelectric semiconductor switch operates with low level inputs JPL-SC-068	B65-10033	01
<b>INFLATABLE STRUCTURE</b> New inflatable liferaft is nontippable MSC-4A	B64-10001	05	<b>INSERT</b> Gate valve with ceramic-coated base operates at high temperatures ARC-23	B63-10562	03
<b>INFORMATION PROCESSING</b> Superconductor magnets used for stagger-tuning traveling-wave maser GSFC-292	B65-10165	01	<b>INSERTION</b> Improved insertion-loss tester JPL-358	B64-10080	01
<b>INFORMATION RETRIEVAL</b> Opaque microfiche masthead permits easy reading HQ-7	B65-10306	01	<b>INSPECTION</b> Use of photographs speeds inspection of printed-circuit boards MSC-72	B64-10118	01
<b>INFRARED RADIATION</b> IR-transmission glasses formed from oxides of bismuth and tellurium M-FS-279	B65-10190	03	Crack detection method is safe in presence of liquid oxygen M-FS-236	B65-10107	03
Infrared shield facilitates optical pyrometer measurements LANGLEY-133	B65-10272	02	<b>INSTALLATION</b> Low-cost tool minimizes damage to O-rings during installation MSC-140	B65-10116	05
Wedge immersed thermistor bolometer measures infrared radiation GSFC-443	B65-10330	02	<b>INSTRUMENTATION</b> Instrument adjustment knob locks to prevent accidental maladjustment M-FS-190	B64-10249	05
<b>INJECTION</b> Filler device for handling hot corrosive materials MSC-85	B64-10166	03	Gapped toroid provides infinite resolution of delay-line pickup GSFC-370	B65-10258	01
Economical fabrication process produces high-quality junction transistors JPL-SC-065	B64-10330	01	<b>INSULATING MATERIAL</b> Modified rf coaxial connector ends vacuum chamber wiring problem GSFC-150	B64-10010	01
<b>INLET</b> Packless valve with all-metal seal handles wide temperature, pressure range JPL-361	B63-10228	05	<b>INSULATION</b> Low-cost insulation system for cryostats eliminates need for a vacuum LEWIS-64	B63-10365	03
Filter for high-pressure gases has easy take-down, assembly JPL-373	B63-10234	03	Spherical electrode eliminates high-voltage breakdown LEWIS-155	B65-10139	01
Fluid-pressure meter can be calibrated without removal from flow line M-FS-98	B63-10502	05	Refractory oxides evaluated for high-temperature use LANGLEY-121	B65-10167	03
<b>INORGANIC COATING</b> Anodization process produces opaque, reflective coatings on aluminum M-FS-348	B65-10336	03	Thin transparent films formed from powdered glass GSFC-352	B65-10217	03
<b>INORGANIC COMPOUND</b> Inorganic paint is durable, fireproof, easy to apply GSFC-366	B65-10156	03	Insulation accelerates rate of cooling with cryogenic fluid MSC-161	B65-10240	02
<b>INPUT</b> Veitch diagram plotter simplifies boolean functions JPL-385	B63-10241	05	Closed fluid system without moving parts controls temperature LEWIS-222	B65-10331	02
Double-throw microwave device switches two lines quickly JPL-410	B63-10258	01	Soluble undercoating facilitates removal of foamed-in-place insulation LEWIS-193	B65-10344	03
Computer circuit will fit on single silicon chip JPL-513	B63-10514	01	Air-cured ceramic coating insulates against high heat fluxes M-FS-150	B65-10357	03
Transistorized converter provides nondissipative regulation GSFC-238	B64-10305	01	<b>INSULATOR</b> Connector for thermocouple leads saves costly wire, makes reliable connectors LANGLEY-26	B63-10529	01
Stepping motor drive circuit designed for low power drain GSFC-198	B65-10026	01	Insulator-holder protects transistors in dense electronic assemblies MSC-214	B65-10389	01
			<b>INTEGRATED CIRCUIT</b> Field-effect transistor replaces bulky		

SUBJECT INDEX

transformer in analog-gate circuit GSFC-351	B65-10284	01	LEWIS-73	B63-10440	01
<b>INTEGRATOR</b>			Apparatus measures very small thrusts W00-048	B64-10284	05
Digital logic elements provide additional functions from analog input MSC-64	B64-10064	01	Wire bundle formed into grids with minute interstices W00-089	B65-10372	03
Solid-state switching used to speed up capacitive integrator LANGLEY-104	B65-10159	01	<b>ION PUMP</b>		
Electronic ampere-hour integrator is accurate to one percent GSFC-203	B65-10308	01	Ion pump provides increased vacuum pumping speed NEO-13	B65-10239	02
<b>INTENSITY</b>			<b>IONIZATION GAUGE</b>		
Variable light source with a million-to-one intensity ratio JPL-W00-008	B63-10424	03	Precision gage measures ultrahigh vacuum levels GSFC-114	B63-10597	01
<b>INTERFACE</b>			<b>IRON</b>		
Indium foil with beryllia washer improves transistor heat dissipation GSFC-42	B63-10033	01	Modified filter prevents conduction of micro- wave signals along high-voltage power supply leads JPL-63	B63-10091	01
Seal allows blind assembly and thermal expan- sion of components NU-0005	B65-10053	05	<b>IRON OXIDE</b>		
<b>INTERFEROMETER</b>			Cryogenic filter method produces super-pure helium and helium isotopes JPL-374	B63-10235	03
Interferometer combines laser light source and digital counting system MSC-151	B65-10161	01	Magnetic fluid readily controlled in zero gravity environment LEWIS-126	B65-10335	03
Interferometer construction assures parallelism of critical components JPL-704	B65-10292	02	<b>ISOLATION</b>		
Unique construction makes interferometer insensitive to mechanical stresses JPL-725	B65-10295	02	High-pass RF coaxial filter rejects DC and low frequency signals GSFC-73	B64-10173	01
<b>INTERPOLATION</b>			<b>ISOLATOR</b>		
Simple scale interpolator facilitates reading of graphs LANGLEY-88	B65-10070	05	Wire mesh isolator protects sensitive elec- tronic components GSFC-347	B65-10216	05
<b>INTERSTICE</b>			<b>ITERATION</b>		
Wire bundle formed into grids with minute interstices W00-089	B65-10372	03	Computer modification reduces time of performing iterative division M-FS-166	B65-10005	01
<b>INVERTER</b>					
Circuit controls transients in SCR inverters GSFC-120	B63-10600	01	<b>J</b>		
<b>INVESTMENT CASTING</b>			<b>JET FUEL</b>		
Vacuum forming of thermoplastic sheet results in low-cost investment casting patterns ARC-7	B63-10008	05	Centrifugal device separates liquid from gas MSC-282	B65-10394	05
<b>IODIDE</b>			<b>JIG</b>		
Cesium iodide crystals fused to vacuum tube faceplates GSFC-67	B63-10476	03	Jig and fixture aid fabrication of tungsten rivets LEWIS-185	B65-10101	05
New method used to fabricate gallium arsenide photovoltaic device W00-062	B64-10019	01	Spiral heater coils hand-formed with fixture LEWIS-208	B65-10192	05
Pressure transducer 3/8-inch in size can be faired into surface W00-065	B64-10021	05	<b>JOINT</b>		
<b>ION</b>			Lightweight universal joint transmits both torque and thrust JPL-375	B63-10236	05
Fine-mesh screen made by simplified method W00-104	B64-10282	03	Sleeve and cutter simplify disconnecting welded joint in tubing JPL-384	B63-10240	05
<b>ION BEAM</b>			New method used to fabricate light-weight heat exchanger for rocket motor LEWIS-43	B63-10346	02
New apparatus increases ion beam power density LEWIS-73	B63-10440	01	Circuit reliability boosted by soldering pins of disconnect plugs to sockets JPL-447	B64-10002	01
<b>ION DENSITY</b>			Flexible fastener allows thermal expansion LANGLEY-40	B64-10145	05
New apparatus increases ion beam power density LEWIS-73	B63-10440	01	Splice plate design assures structural separation by mild explosive MSC-137	B65-10166	05
<b>ION ENGINE</b>			Ball-and socket joints provide accurate biaxial gimbal		
New apparatus increases ion beam power density					

SUBJECT INDEX

JPL-658	B65-10205	05	<b>LATHE</b>		
Thermocouple-to-instrumentation connector features quick assembly NU-0022	B65-10246	05	Lathe converted for grinding aspheric surfaces GSFC-115	B63-10556	05
Universal bellows joint restraint permits angular and offset movement W00-102	B65-10371	05	Metal bellows custom-fabricated from tubing LEWIS-192	B65-10150	05
Photosensors used to maintain welding electrode-to-joint alignment MSC-243	B65-10401	05	Lathe attachment used to machine elliptical cones MSC-100	B65-10168	05
<b>JOURNAL BEARING</b>			Self-aligning fixture used in lathe chuck jaw refacing FRC-21	B65-10198	05
Ohmmeter senses depletion of lubricant in journal bearings LEWIS-37	B64-10042	01	<b>LEAD</b>		
<b>JUNCTION TRANSISTOR</b>			Metals plated on fluorocarbon polymers JPL-544	B63-10612	03
Economical fabrication process produces high-quality junction transistors JPL-SC-065	B64-10330	01	<b>LEAD OXIDE</b>		
<b>K</b>			Lead oxide ceramic makes excellent high-temperature lubricant LEWIS-144	B64-10116	03
<b>KINETIC ENERGY</b>			<b>LEAD TELLURIDE</b>		
Kinetic-energy absorber employs frictional force between mating cylinders LEWIS-75	B63-10442	05	Thermoelectric elements diffusion-bonded to tungsten electrodes GSFC-346	B65-10309	01
Shock absorber operates over wide range MSC-168	B65-10241	05	<b>LEAKAGE</b>		
<b>L</b>			Vented piston seal prevents fluid leakage between two chambers JPL-179	B63-10141	05
<b>LABORATORY APPARATUS</b>			Self sealing disconnect for tubing forms metal seal after breakaway JPL-354	B63-10226	05
Ceramic-coated boat is chemically inert, provides good heat transfer LANGLEY-90	B65-10063	05	Diaphragm eliminates leakage in cryogenic fluid duct coupling W00-142	B65-10227	05
<b>LAMINATE</b>			Weld leaks rapidly and safely detected M-FS-362	B65-10265	01
Flexible curtain shields equipment from intense heat fluxes M-FS-48	B65-10044	03	<b>LEGIBILITY</b>		
<b>LAMINATED MATERIAL</b>			Disk calculator indicates legible lettering size for slide projection GSFC-409	B65-10339	05
Peel resistance of adhesive bonds accurately measured GSFC-320	B65-10173	03	<b>LENS</b>		
Device detects unbonded areas in plastic laminates W00-206	B65-10380	01	Lathe converted for grinding aspheric surfaces GSFC-115	B63-10556	05
Drill bit design assures clean holes in laminated materials W00-098	B65-10386	05	Optical arrangement increases useful light output of semiconductor diodes JPL-SC-064	B65-10020	05
<b>LAMP</b>			<b>LIGHT</b>		
Igniting system for mercury vapor lamps protects transistorized sustaining supply JPL-421	B63-10262	01	Variable light source with a million-to-one intensity ratio JPL-W00-008	B63-10424	03
<b>LAP JOINT</b>			<b>LIGHT EMISSION</b>		
Lightweight door seals cryogenic container against diaphragm type loading M-FS-476	B65-10402	05	Optical arrangement increases useful light output of semiconductor diodes JPL-SC-064	B65-10020	05
<b>LASER</b>			<b>LIGHT INTENSITY</b>		
Modification increases light output of injection-luminescent diodes M-FS-192	B65-10006	01	Variable light source with a million-to-one intensity ratio JPL-W00-008	B63-10424	03
Laser beam transmits electric power GSFC-293	B65-10158	01	<b>LIGHT MODULATOR</b>		
Interferometer combines laser light source and digital counting system MSC-151	B65-10161	01	Light ray modulation controls optical system alignment GFSC-171	B65-10211	02
Solid-state laser transmitter is amplitude modulated MSC-121	B65-10238	01	Communication system uses modulated laser beam GSFC-377	B65-10333	01
Communication system uses modulated laser beam GSFC-377	B65-10333	01	<b>LIGHT PROBE</b>		
			Photoelectric system continuously monitors liquid level M-FS-417	B65-10382	01
			<b>LIGHT SOURCE</b>		
			Fresnel cup reflector directs maximum energy from light source		

SUBJECT INDEX

JPL-424	B63-10263	03	GSFC-257	B65-10152	01
Mirror device aligns machine surface perpendicular to sight lines			<b>LINK</b>		
W00-5	B63-10421	02	Electromechanically operated camera shutter provides uniform exposure		
Variable light source with a million-to-one intensity ratio			JPL-357	B63-10227	01
JPL-W00-008	B63-10424	03	<b>LIQUID</b>		
Attachment converts microscope to point source autocollimator			Level of super-cold liquids automatically maintained by levelometer		
JPL-499	B64-10124	05	JPL-397	B63-10250	01
Electronic device simulates respiration rate and depth			Special pliers connect hose containing liquid under pressure		
MSC-89	B64-10255	01	JPL-IT-1003	B63-10291	05
Modification increases light output of injection-luminescent diodes			Tool facilitates sealing of metal fill tubes		
M-FS-192	B65-10006	01	MSC-24	B63-10519	05
Simple optical system used to align spectrograph			Filler device for handling hot corrosive materials		
LANGLEY-92	B65-10071	02	MSC-85	B64-10166	03
Instrument calibrates low gas-rate flowmeters			<b>LIQUID FLOW</b>		
MSC-134	B65-10137	01	Meter accurately measures flow of low-conductivity fluids		
Interferometer combines laser light source and digital counting system			JPL-0021	B63-10280	01
MSC-151	B65-10161	01	Fluid check valve has fail-safe feature		
Photoresistance analog multiplier has wide range			JPL-0019	B65-10207	05
GSFC-360	B65-10287	01	Spiraled channels improve heat transfer between fluids		
<b>LIGHTING</b>			JPL-694	B65-10291	02
New low-level AC amplifier provides adjustable noise cancellation and automatic temperature compensation			Volumetric system calibrates meters for large flow rates		
MSC-108	B65-10003	05	W00-130	B65-10323	05
<b>LIGHTWEIGHT</b>			<b>LIQUID-GAS MIXTURE</b>		
Break-up of metal tube makes one-time shock absorber, bars rebound			Centrifugal device separates liquid from gas		
LANGLEY-1A	B63-10304	05	MSC-282	B65-10394	05
Lightweight magnesium-lithium alloys show promise			<b>LIQUID HELIUM</b>		
M-FS-17	B63-10389	03	Cryogenic filter method produces super-pure helium and helium isotopes		
Comfortable, lightweight safety helmet holds radio transmitter, receiver			JPL-374	B63-10235	03
MSC-53	B64-10015	05	Automatic thermal switch accelerates cooling-down of cryogenic system		
<b>LIMITER</b>			JPL-655	B65-10068	01
Tunnel-diode circuit features zero-level clipping			Vacuum chamber provides improved insulation and support for cryostat		
GSFC-241	B65-10002	01	M-FS-415	B65-10368	02
High-speed square-wave current limiter operates efficiently			<b>LIQUID LEVEL</b>		
JPL-SC-073	B65-10233	01	Liquid-level meter has no moving parts		
<b>LINEAR CIRCUIT</b>			M-FS-3	B63-10378	03
Simple circuit functions as frequency discriminator for PFM signals			Oscillator circuit measures liquid level in tanks		
GSFC-267	B65-10102	01	M-FS-245	B65-10209	01
<b>LINEAR SYSTEM</b>			Photoelectric system continuously monitors liquid level		
Simple circuit provides adjustable voltage with linear temperature variation			M-FS-417	B65-10382	01
JPL-W00-029	B63-10537	01	<b>LIQUID MERCURY</b>		
Voltage generator sweeps oscillator frequency linearly with time			Liquid switch is remotely operated by low DC voltage		
M-FS-219	B64-10320	01	GSFC-119	B63-10599	01
Interferometer combines laser light source and digital counting system			<b>LIQUID NITROGEN</b>		
MSC-151	B65-10161	01	Helical tube separates nitrogen gas from liquid nitrogen		
<b>LINEARITY</b>			JPL-398	B63-10251	05
Raster linearity of video cameras calibrated with precision tester			Cryopumping of hydrogen in vacuum chambers is aided by catalytic oxidation of hydrogen		
GSFC-200	B64-10209	01	LEWIS-15	B63-10340	05
Circuit reduces distortion of FM modulator			<b>LIQUID OXYGEN /LOX/</b>		
			Crack detection method is safe in presence of liquid oxygen		
			M-FS-236	B65-10107	03
			<b>LITHIUM ALLOY</b>		
			Lightweight magnesium-lithium alloys show		

SUBJECT INDEX

promise M-FS-17	B63-10389	03	LANGLEY-129	B65-10193	01
<b>LITHIUM FLUORIDE</b>			Delayed ripple counter simplifies square-root computation	B65-10343	01
Cesium iodide crystals fused to vacuum tube faceplates			GSFC-398		
GSFC-67	B63-10476	03	Simple circuit performs binary addition and subtraction	B65-10355	01
<b>LOAD FACTOR</b>			GSFC-399		
Rapid billet loader aids extrusion of refractory metals			<b>LOOP</b>		
LEWIS-50	B63-10354	05	Bandwidth switching is transient-free, avoids loss of loop lock	B64-10349	01
Ring counter may be advanced or retarded by command signal			WDD-054		
GSFC-101	B64-10144	01	<b>LOW FREQUENCY</b>		
Circuit improvement produces monostable multivibrator with load-carrying capability			New low-level A-C amplifier provides adjustable noise cancellation and automatic temperature compensation	B63-10003	04
GSFC-34A	B65-10011	01	ARC-2		
Variable load automatically tests dc power supplies			High-pass RF coaxial filter rejects DC and low frequency signals	B64-10173	01
GSFC-291	B65-10105	01	GSFC-73		
Lightweight door seals cryogenic container against diaphragm type loading			<b>LOW PASS FILTER</b>		
M-FS-476	B65-10402	05	Computer determines high-frequency phase stability	B63-10555	01
			GSFC-113		
<b>LOADING</b>			<b>LOW POWER</b>		
Self-balancing beam permits safe, easy load handling under overhang			Radiant heater for vacuum furnaces offers high structural rigidity, low heat loss	B63-10342	01
M-FS-84	B63-10571	05	LEWIS-39		
Circuit controls transients in SCR inverters			<b>LOW TEMPERATURE BRAZING</b>		
GSFC-120	B63-10600	01	Coating method enables low-temperature brazing of stainless steel	B65-10250	03
Buckle joins web straps quickly, adjusts easily			NU-0030		
LANGLEY-21	B64-10119	05	<b>LOW TEMPERATURE ENVIRONMENT</b>		
ptc thermistor protects multiloaded power supplies			Gallium useful bearing lubricant in high-vacuum environment	B63-10337	03
GSFC-236	B64-10281	01	LEWIS-12		
<b>LOADING APPARATUS</b>			<b>LUBRICANT</b>		
Rapid billet loader aids extrusion of refractory metals			Gallium useful bearing lubricant in high-vacuum environment	B63-10337	03
LEWIS-50	B63-10354	05	LEWIS-12		
<b>LOADING RATE</b>			Molybdenum disulfide mixtures make effective high-vacuum lubricants	B63-10453	03
Shock absorber operates over wide range			M-FS-54		
MSC-168	B65-10241	05	<b>Burnishing technique improves lubrication of threaded fasteners</b>	B65-10302	03
<b>LOGARITHM</b>			LEWIS-217		
Logarithmic amplifier uses field effect transistors			Unique gear design provides self-lubrication	B65-10366	03
JPL-509	B65-10145	01	JPL-SC-079		
<b>LOGIC</b>			<b>LUBRICATING OIL</b>		
Binary counter uses fluid logic elements			Ohmmeter senses depletion of lubricant in journal bearings	B64-10042	01
M-FS-323	B65-10377	01	LEWIS-37		
Binary counter accumulates time by complementary preset			<b>LUBRICATION</b>		
MSC-242	B65-10399	01	Gate valve with ceramic-coated base operates at high temperatures	B63-10562	03
<b>LOGIC CIRCUIT</b>			ARC-23		
Frequency-shift-keyer circuit improves PCM conversion for radio transmission			<b>LUBRICATION SYSTEM</b>		
GSFC-80	B63-10511	01	Miniature bearings lubricated by sonic dispersion method	B65-10106	03
Computer circuit will fit on single silicon chip			M-FS-202		
JPL-513	B63-10514	01	<b>LUNAR GRAVITATIONAL EFFECT</b>		
Digital logic elements provide additional functions from analog input			Technique simulates effect of reduced gravity	B64-10146	04
MSC-64	B64-10064	01	LANGLEY-44		
Ring counter may be advanced or retarded by command signal			<b>LUNG</b>		
GSFC-101	B64-10144	01	Device induces lungs to maintain known constant pressure	B64-10108	04
Novel circuit combines pulse stretcher with NOR gate			MSC-50		
GSFC-187	B64-10150	01	<b>M</b>		
Logic circuit exhibits optimum performance			<b>MACHINE TOOL</b>		
			Setting of angles on machine tools speeded by		

SUBJECT INDEX

magnetic protractor ARC-5	B63-10006	01	reliability and reduced power consumption GSFC-246	B65-10194	01
Sleeve and cutter simplify disconnecting welded joint in tubing JPL-384	B63-10240	05	<b>MAGNETIC FIELD</b> Supercold technique duplicates magnetic field in second superconductor JPL-376	B63-10237	05
<b>MACHINING</b>			Shaped superconductor cylinder retains intense magnetic field JPL-381	B63-10238	01
Metal-bending brake facilitates lightweight, close-tolerance fabrication ARC-29	B64-10069	05	Explosives actuate nonmagnetic indexing device GSFC-237	B65-10017	05
Micromachining produces optical apertures to micron dimensions GSFC-206	B64-10211	05	Magnetic field controls carbon arc tail flame MSC-139	B65-10108	01
Lathe attachment used to machine elliptical cones MSC-100	B65-10168	05	High permeability semiconductors permit close-tolerance soldering GSFC-319	B65-10134	05
<b>MAGNESIUM</b>			Density trace made with computer printout GSFC-322	B65-10200	01
New method forms bond line free of voids LANGLEY-20	B63-10558	05	Superconductor shields test chamber from ambient magnetic fields JPL-627	B65-10297	02
<b>MAGNESIUM ALLOY</b>			Magnetometer measures orthogonal components of magnetic fields GSFC-395	B65-10315	01
Lightweight magnesium-lithium alloys show promise M-FS-17	B63-10389	03	<b>MAGNETIC FIELD COIL</b> Magnetic field test coils are temperature compensated GSFC-294	B65-10081	02
<b>MAGNESIUM-LITHIUM ALLOY</b>			<b>MAGNETIC FIELD INTENSITY</b> Shaped superconductor cylinder retains intense magnetic field JPL-381	B63-10238	01
Adherent protective coatings plated on magnesium-lithium alloy M-FS-365	B65-10294	03	<b>MAGNETIC INSTRUMENT</b> Variable frequency magnetic multivibrator generates stable square-wave output GSFC-AE-21	B65-10124	01
<b>MAGNET</b>			Optical output enhances flowmeter accuracy M-FS-482	B65-10395	02
Unmanned seismometer levels self, corrects drift errors GSFC-100	B63-10551	01	<b>MAGNETIC MATERIAL</b> Flexible magnetic planning boards are easily transported M-FS-340	B65-10219	05
Ball bearing used in design of rugged flow- meter LEWIS-159	B64-10170	05	<b>MAGNETIC MEMORY</b> Transfluxor circuit amplifies sensing current for computer memories JPL-406	B63-10255	01
<b>MAGNETIC CIRCUIT</b>			<b>MAGNETIC RESONANCE</b> Magnetometer measures orthogonal components of magnetic fields GSFC-395	B65-10315	01
Transfluxor circuit amplifies sensing current for computer memories JPL-406	B63-10255	01	<b>MAGNETIC TAPE</b> Low-cost tape system measures velocity of acceleration GSFC-85	B63-10512	01
Variable frequency transistor inverters use multiple core transformers variable frequency transistor inverters use multiple core transformers GSFC-183	B65-10119	01	Metal strip forms 21 foot boom, rolls up for compact storage GSFC-151	B64-10011	05
Magnetic-shift-register circuit controls step motor operations GSFC-340	B65-10226	01	Compact cartridge drives coded tape at constant readout speed JPL-472	B64-10222	01
<b>MAGNETIC CONTROL</b>			<b>MAGNETIC TAPE RECORDER</b> Small digital recording head has parallel bit channels, minimizes cross talk JPL-0029	B63-10284	01
Magnetic fluid readily controlled in zero gravity environment LEWIS-126	B65-10335	03	Circuit converts AM signals to FM for magnetic recording GSFC-227	B65-10001	01
<b>MAGNETIC CORE</b>			PCM magnetic tape system efficiency records		
Transfluxor circuit amplifies sensing current for computer memories JPL-406	B63-10255	01			
New sintering process adjusts magnetic value of ferrite cores GSFC-129	B63-10606	01			
Blocking oscillator uses low triggering voltage MSC-58	B64-10017	01			
Molded elastomer provides compact ferrite-core holder, simplifies assembly JPL-584	B64-10084	05			
Circuit detects errors in address currents for magnetic core arrays M-FS-234	B65-10047	01			
Improved magnetometer uses toroidal gating coil GSFC-249	B65-10103	01			
Analog-to-digital converter has increased					

SUBJECT INDEX

and reproduces data GSFC-375	B65-10311	01	ARC-28	B64-10068	03
<b>MAGNETISM</b>			Delayed ripple counter simplifies square-root computation GSFC-398	B65-10343	01
Setting of angles on machine tools speeded by magnetic protractor ARC-5	B63-10006	01	<b>MCLEOD GAUGE</b>		
<b>MAGNETOHYDRODYNAMIC ACCELERATION</b>			Baking enables McLeod gauge to measure in ultrahigh vacuum range GSFC-440	B65-10329	01
Segmented electrode increases operating pressure of MHD accelerator LANGLEY-95	B65-10356	02	<b>MEASURES</b>		
<b>MAGNETOHYDRODYNAMIC GENERATOR</b>			Oil-smearred models aid wind tunnel measurements LANGLEY-4	B63-10311	03
Wire winding increases lifetime of oxide- coated cathodes LEWIS-154	B65-10032	03	Ultra-sensitive transducer advances micro- measurement range ARC-26	B64-10004	01
<b>MAGNETOMETER</b>			<b>MEASURING APPARATUS</b>		
Improved magnetometer uses toroidal gating coil GSFC-249	B65-10103	01	Low-cost tape system measures velocity of acceleration GSFC-85	B63-10512	01
Magnetometer measures orthogonal components of magnetic fields GSFC-395	B65-10315	01	Ultra-sensitive transducer advances micro- measurement range ARC-26	B64-10004	01
<b>MAGNETRON</b>			Improved insertion-loss tester JPL-358	B64-10080	01
Ion pump provides increased vacuum pumping speed NEO-13	B65-10239	02	Apparatus measures concentration of suspended droplets in gas streams LANGLEY-31	B64-10237	01
<b>MAINTENANCE</b>			Gage measures electrical connector pin retention force JPL-SC-071	B65-10034	03
Magnetic field controls carbon arc tail flame MSC-139	B65-10108	01	Ionization vacuum gage starts quickly, is unaffected by spurious currents JPL-304	B65-10036	02
<b>MANDREL</b>			Metal diaphragm used to calibrate miniature transducers M-FS-207	B65-10059	01
Vacuum forming of thermoplastic sheet results in low-cost investment casting patterns ARC-7	B63-10008	05	Device measures curved surface finish on gear teeth WOO-112	B65-10064	05
Collar positions strip stock used to form coil on mandrel JPL-198	B65-10130	05	Sensitive level sensor made with spirit level, gives electrical output LANGLEY-49	B65-10067	01
Metal bellows custom-fabricated from tubing LEWIS-192	B65-10150	05	System measures angular displacement without contact LANGLEY-46	B65-10073	01
<b>MANOMETER</b>			Transducer senses displacements of panels subjected to vibration ARC-37	B65-10085	01
Fluid-pressure measurement apparatus uses short-length manometer tubes LEWIS-28	B65-10027	05	Apparatus measures swelling of membranes in electrochemical cells GSFC-280	B65-10087	01
<b>MANUAL CONTROL</b>			Microwave technique measures plasma characteristics LANGLEY-134	B65-10122	02
Heavy-duty staple remover operated by hand JPL-IT-1004	B63-10292	05	System measures unidirectional forces, excludes extraneous forces LEWIS-170	B65-10154	05
Knob linkage permits one-hand control of several operations MSC-30	B65-10022	05	Device enables measurement of moments of inertia about three axes GSFC-49	B65-10176	05
Handtool facilitates extraction of circuit modules LANGLEY-38	B65-10231	05	Sensitive electrometer features digital output GSFC-288	B65-10206	01
Manual-feed adapter permits microfilming of continuous oscillograph output NU-0029	B65-10249	01	Oscillator circuit measures liquid level in tanks M-FS-245	B65-10209	01
Rack mount device quickly inserts or extracts chassis units MSC-244	B65-10385	05	Multi-axial analyzer detects low-energy		
<b>MASKING</b>					
Reusable neoprene jacket protects parts for chemical milling WOO-071	B65-10179	03			
<b>MATERIAL TESTING</b>					
Graphite element serves as radiant heat source M-FS-105	B65-10218	01			
Multiple test chamber exposes materials to various environments MSC-179	B65-10268	01			
<b>MATHEMATICS /GEN/</b>					
Mechanical properties of plastics predeter- mined by empirical method					

**SUBJECT INDEX**

electrons GSFC-329	B65-10213	01	<b>MECHANISM</b> Simple mechanism combines positive locking and quick-release features W00-4	B63-10420	05
Instrument accurately measures extremely low air densities M-FS-193	B65-10221	01	<b>MEDICAL EQUIPMENT</b> Tiny biomedical amplifier combines high performance, low power drain ARC-41	B65-10203	01
Servo calorimeter measures material heating rate NU-0024	B65-10247	01	<b>MELTING POINT</b> Integral coolant channels simply made by melt-out method M-FS-91	B63-10497	05
Differential pressure gauge has fast response M-FS-358	B65-10285	05	<b>MEMORY STORAGE UNIT</b> Circuit detects errors in address currents for magnetic core arrays M-FS-234	B65-10047	01
Coaxial capacitor used to determine fluid density LEWIS-232	B65-10296	02	Improved wire memory matrix uses very little power JPL-SC-167	B65-10359	01
Remote rapidly varying pressures accurately measured FRC-28	B65-10301	01	<b>MERCURY /METAL/</b> Oil-damped mercury pool makes precise optical alignment tool GSFC-353	B65-10253	02
Improved strain-wire flowmeter has fast response time LEWIS-241	B65-10304	01	<b>MERCURY ARC</b> Emission tester for high-power vacuum tubes JPL-628	B64-10158	01
Electronic ampere-hour integrator is accurate to one percent GSFC-203	B65-10308	01	<b>MERCURY LIGHT</b> Igniting system for mercury vapor lamps protects transistorized sustaining supply JPL-421	B63-10262	01
Air brake-dynamometer accurately measures torque LEWIS-163	B65-10312	05	High-intensity flashing beacon powered by mercury cells LANGLEY-80	B65-10361	01
Magnetometer measures orthogonal components of magnetic fields GSFC-395	B65-10315	01	<b>MERCURY VAPOR</b> Igniting system for mercury vapor lamps protects transistorized sustaining supply JPL-421	B63-10262	01
Direct force-measuring transducer used in blood pressure research ARC-53	B65-10325	01	<b>METAL</b> High purity electroforming yields superior metal models ARC-6	B63-10007	05
Rough surface improves stability of air-sounding balloons M-FS-320	B65-10326	05	Packless valve with all-metal seal handles wide temperature, pressure range JPL-361	B63-10228	05
Baking enables McLeod gauge to measure in ultrahigh vacuum range GSFC-440	B65-10329	01	Break-up of metal tube makes one-time shock absorber, bars rebound LANGLEY-1A	B63-10304	05
Wedge immersed thermistor bolometer measures infrared radiation GSFC-443	B65-10330	02	Tool facilitates sealing of metal fill tubes MSC-24	B63-10519	05
Vibrating diaphragm measures high electrostatic field strengths MSC-189	B65-10352	01	Refractory thermal insulation for smooth metal surfaces M-FS-160	B64-10099	03
Three-dimensional wire-mesh capacitor system measures fluid density W00-194	B65-10379	01	Mounting for diodes provides efficient heat sink M-FS-197	B64-10283	01
Photoelectric system continuously monitors liquid level M-FS-417	B65-10382	01	Metal sheath improves thermocouple using graphite in one leg NU-0011	B65-10051	01
<b>MECHANICAL DRAWING</b> Built-in templates speed up process for making accurate models LANGLEY-23	B63-10526	05	Titanium treatment improves brazed joints MSC-127	B65-10153	05
Use of photographs speeds inspection of printed-circuit boards MSC-72	B64-10118	01	<b>METAL BONDING</b> Refractory metals welded or brazed with tungsten inert gas equipment LEWIS-219	B65-10319	05
<b>MECHANICAL PROPERTY</b> Mechanical properties of plastics predetermined by empirical method ARC-28	B64-10068	03	<b>METAL FORMING</b> Integral ribs formed in metal panels by cold-press extrusion M-FS-230	B65-10141	05
<b>MECHANICAL SYSTEM</b> Electromechanically operated camera shutter provides uniform exposure JPL-357	B63-10227	01	Metal parts hydrosized by explosive force		
Multiple test tubes stirred mechanically ARC-42	B65-10120	01			

SUBJECT INDEX

M-FS-289	B65-10170	05	continuous oscillograph output NU-0029	B65-10249	01
Fiberglass dies speed forming of large metal sheets			Opaque microfiche masthead permits easy reading		
M-FS-214	B65-10210	05	HQ-7	B65-10306	01
Die and telescoping punch form convolutions in thin diaphragm			Planetary camera control improves microfiche production		
JPL-SC-135	B65-10393	05	HQ-1	B65-10313	01
<b>METAL-METAL BONDING</b>			<b>MICROINSTRUMENTATION</b>		
Stringent cleaning technique assures reliable epoxy bond			Micromachining produces optical apertures to micron dimensions		
GSFC-161	B64-10142	03	GSFC-206	B64-10211	05
<b>METAL OXIDE SEMICONDUCTOR /MOS/</b>			<b>MICROMETROROID</b>		
Field-effect transistor replaces bulky transformer in analog-gate circuit			Improved sensor counts micrometeoroid penetrations		
GSFC-351	B65-10284	01	LEWIS-76	B63-10443	01
<b>METAL PLATE</b>			Ultra-sensitive transducer advances micro-measurement range		
Built-in templates speed up process for making accurate models			ARC-26	B64-10004	01
LANGLEY-23	B63-10526	05	<b>MICROMETER</b>		
<b>METAL REINFORCEMENT</b>			Apparatus measures swelling of membranes in electrochemical cells		
Method of welding joint in closed vessel improves quality of seam			GSFC-280	B65-10087	01
JPL-170	B63-10139	05	<b>MICROMINIATURIZED ELECTRONIC EQUIPMENT</b>		
<b>METAL WORKING</b>			Frequency discriminator with binary output eliminates tuned circuits		
Rapid billet loader aids extrusion of refractory metals			M-FS-376	B65-10349	01
LEWIS-50	B63-10354	05	<b>MICROMOTOR</b>		
Guide for extrusion dies eliminates straightening operation			Computer circuit will fit on single silicon chip		
LEWIS-152	B64-10014	05	JPL-513	B63-10514	01
Jig and fixture aid fabrication of tungsten rivets			<b>MICROPHONE</b>		
LEWIS-185	B65-10101	05	Small foamed polystyrene shield protects low-frequency microphones from wind noise		
Collar positions strip stock used to form coil on mandrel			M-FS-123	B63-10579	01
JPL-198	B65-10130	05	<b>MICROSCOPE</b>		
Lathe attachment used to machine elliptical cones			Attachment converts microscope to point source autocollimator		
MSC-100	B65-10168	05	JPL-499	B64-10124	05
<b>METALLURGY</b>			Micromachining produces optical apertures to micron dimensions		
Rotating filters permit wide range of optical pyrometry			GSFC-206	B64-10211	05
LANGLEY-33	B65-10100	02	<b>MICROWAVE</b>		
Rotating holder permits accurate grinding of metallurgical microsamples			Novel horn antenna reduces side lobes, improves radiation pattern		
LEWIS-131	B65-10262	05	JPL-425	B63-10264	01
<b>METEOROID</b>			<b>MICROWAVE ANTENNA</b>		
Ultra-sensitive transducer advances micro-measurement range			Flange on microwave antenna subreflector cuts ground noise		
ARC-26	B64-10004	01	JPL-362	B63-10229	01
<b>METEOROLOGICAL BALLOON</b>			<b>MICROWAVE ATTENUATION</b>		
Rough surface improves stability of air-sounding balloons			Modified filter prevents conduction of microwave signals along high-voltage power supply leads		
M-FS-320	B65-10326	05	JPL-63	B63-10091	01
<b>METER</b>			<b>MICROWAVE CIRCUIT</b>		
Liquid-level meter has no moving parts			Double-throw microwave device switches two lines quickly		
M-FS-3	B63-10378	03	JPL-410	B63-10258	01
<b>MICROCIRCUIT</b>			Superconductor magnets used for stagger-tuning traveling-wave maser		
Field-effect transistor replaces bulky transformer in analog-gate circuit			GSFC-292	B65-10165	01
GSFC-351	B65-10284	01	<b>MICROWAVE FILTER</b>		
<b>MICROELECTRONICS</b>			Modified filter prevents conduction of microwave signals along high-voltage power supply leads		
Logic circuit exhibits optimum performance			JPL-63	B63-10091	01
LANGLEY-129	B65-10193	01	<b>MICROWAVE FREQUENCY</b>		
<b>MICROFILM</b>			Modified filter prevents conduction of microwave signals along high-voltage power supply leads		
Library of documents compressed into lap-held display kit					
MSC-125	B65-10030	01			
Manual-feed adapter permits microfilming of					

SUBJECT INDEX

JPL-63	B63-10091	01	Improved molybdenum disulfide-silver motor brushes have extended life	M-FS-64	B63-10479	03
Cryogenic waveguide window is sealed with plastic foam						
JPL-559	B63-10613	01	<b>MONITOR</b>			
<b>MICROWAVE SWITCHING</b>			Circuit switches latching relay in response to signals of different polarity	W00-055	B63-10508	01
Double-throw microwave device switches two lines quickly						
JPL-410	B63-10258	01	Simple circuit continuously monitors thermocouple sensor	M-FS-61	B63-10567	01
<b>MICROWAVE TRANSMISSION</b>			Auxiliary circuit enables automatic monitoring of EKG	MSC-106	B65-10142	01
Traveling-wave tube circuit simplifies microwave relay						
GSFC-299	B65-10127	01	Electromechanical flowmeter accurately monitors fluid flow	GSFC-357	B65-10273	01
<b>MINIATURE ELECTRONIC EQUIPMENT</b>			Rugged pressed disk electrode has low contact potential	MSC-158	B65-10320	01
Metal diaphragm used to calibrate miniature transducers						
M-FS-207	B65-10059	01	<b>MONKEY</b>			
<b>MINIATURIZATION</b>			Test monkeys anesthetized by routine procedure	HQ-18	B65-10332	04
Welded pressure transducer made as small as 1/8th-inch in diameter						
ARC-11	B63-10429	03	<b>MONOCHROMATIC RADIATION</b>			
<b>MIRROR</b>			Computer programs simplify optical system analysis	GSFC-306	B65-10093	01
Variable-transparency wall regulates temperatures of structures						
LANGLEY-25	B63-10528	03	<b>MONOMOLECULAR LAYER</b>			
Light-sensitive potentiometer measures product of two variables			Miniature bearings lubricated by sonic dispersion method	M-FS-202	B65-10106	03
GSFC-240	B65-10076	01	<b>MOTOR SYSTEM</b>			
<b>MISSILE</b>			Improved molybdenum disulfide-silver motor brushes have extended life	M-FS-64	B63-10479	03
High purity electroforming yields superior metal models						
ARC-6	B63-10007	05	Quick-acting clutch disengages idle drive motor	GSFC-143	B64-10028	05
<b>MIXER</b>			Vehicle walks on varied terrain, can assist handicapped persons	W00-005	B64-10274	05
Added diodes increase output of balanced mixer circuit						
GSFC-354	B65-10276	01	Rotor position sensor switches currents in brushless Dc motors	GSFC-315	B65-10151	01
<b>MODULATOR</b>			<b>MULTIPLIER</b>			
Added diodes increase output of balanced mixer circuit			Computer determines high-frequency phase stability	GSFC-113	B63-10555	01
GSFC-354	B65-10276	01				
<b>MODULE</b>			Variable load automatically tests dc power supplies	GSFC-291	B65-10105	01
Portable display paneling has wide use, easy take down and assembly						
ARC-17	B63-10435	05	Photoresistance analog multiplier has wide range	GSFC-360	B65-10287	01
<b>MOLD</b>			<b>MULTIVIBRATOR</b>			
Improved molybdenum disulfide-silver motor brushes have extended life			Monostable circuit with tunnel diode has fast recovery	GSFC-132	B63-10603	01
M-FS-64	B63-10479	03				
Refractory ceramic has wide usage, low fabrication cost			Temperature-sensitive network drives astable multivibrator	GSFC-137	B63-10609	01
M-FS-67	B63-10481	03				
Plastic molds reduce cost of encapsulating electric cable connectors			Circuit improvement produces monostable multivibrator with load-carrying capability	GSFC-34A	B65-10011	01
M-FS-69	B63-10568	05				
Pressure molding of powdered materials improved by rubber mold insert			Variable frequency transistor inverters use multiple core transformers	GSFC-183	B65-10119	01
W00-100	B64-10270	03				
<b>MOLECULAR DISSOCIATION</b>			Variable frequency magnetic multivibrator			
Heater decomposes oil backstreaming from high-vacuum pumps						
GSFC-356	B65-10224	02				
<b>MOLECULAR FLOW</b>						
Test device prevents molecular bounce-back						
GSFC-82	B63-10546	03				
<b>MOLECULE</b>						
Test device prevents molecular bounce-back						
GSFC-82	B63-10546	03				
<b>MOLYBDENUM SULFIDE</b>						
Molybdenum disulfide mixtures make effective high-vacuum lubricants						
M-FS-54	B63-10453	03				

SUBJECT INDEX

generates stable square-wave output GSFC-AE-21	B65-10124	01		
Digital-output cardiometer measures rapid changes in heartbeat rate MSC-133	B65-10143	01		
<b>N</b>				
<b>N-P-N JUNCTION</b>				
Two-stage emitter follower is temperature stabilized MSC-20	B63-10493	01		
<b>NAVIGATION AID</b>				
Improved magnetometer uses toroidal gating coil GSFC-249	B65-10103	01		
<b>NEOPRENE</b>				
Chain friction system gives positive, revers- ible drive ARC-8	B63-10009	05		
Elastomers bonded to metal surfaces seal electrochemical cells GSFC-168	B64-10113	03		
Reusable neoprene jacket protects parts for chemical milling WOO-071	B65-10179	03		
<b>NETWORK SYNTHESIS</b>				
Boron trifluoride nuclear detector preamplifier uses single-cable connection LEWIS-178	B65-10255	01		
<b>NICKEL</b>				
Ellipsoidal optical reflectors reproduced by electroforming GSFC-92	B63-10547	05		
Tungsten wire and tubing joined by nickel brazing M-FS-394	B65-10391	05		
<b>NICKEL-CADMIUM BATTERY</b>				
Didymium compound improves nickel-cadmium cell GSFC-295	B65-10083	03		
<b>NICKEL COMPOUND</b>				
Thoriated nickel bonded by solid-state diffusion method LANGLEY-116	B65-10220	03		
<b>NICKEL PLATING</b>				
Electroless nickel resist used in alkali- etching of aluminum GSFC-284	B65-10162	03		
Nickel solution prepared for precision electroforming WOO-070	B65-10303	03		
Nickel/tin coating protects threaded fasteners in corrosive environment MSC-253	B65-10398	03		
<b>NITROGEN</b>				
Helical tube separates nitrogen gas from liquid nitrogen JPL-398	B63-10251	05		
Compressed gas system operates semitrailer brakes during winching operation JPL-0036	B64-10306	05		
<b>NITROGEN COMPOUND</b>				
Nitrogen dioxide produced by self-sustained pyrolysis of nitrous oxide LANGLEY-32	B65-10074	05		
<b>NOISE ATTENUATION</b>				
Small foamed polystyrene shield protects low- frequency microphones from wind noise M-FS-123	B63-10579	01		
<b>NOISE ELIMINATION</b>				
New low-level A-C amplifier provides adjust- able noise cancellation and automatic tempera- ture compensation ARC-2	B63-10003	04		
Flange on microwave antenna subreflector cuts ground noise JPL-362	B63-10229	01		
<b>NOISE INTENSITY</b>				
Small foamed polystyrene shield protects low- frequency microphones from wind noise M-FS-123	B63-10579	01		
<b>NOISE REDUCTION</b>				
Flange on microwave antenna subreflector cuts ground noise JPL-362	B63-10229	01		
<b>NOISE SUPPRESSOR</b>				
New low-level A-C amplifier provides adjust- able noise cancellation and automatic tempera- ture compensation ARC-2	B63-10003	04		
Novel horn antenna reduces side lobes, improves radiation pattern JPL-425	B63-10264	01		
Small digital recording head has parallel bit channels, minimizes cross talk JPL-0029	B63-10284	01		
Field-effect transistor improves electrometer amplifier ARC-36	B64-10143	01		
<b>NONDESTRUCTIVE TESTING</b>				
Force controlled solenoid drives microweld tester WOO-125	B65-10182	01		
<b>NONLINEAR FEEDBACK</b>				
Nonlinear feedback reduces analog-to-digital converter error ARC-46	B65-10277	01		
<b>NONLINEARITY</b>				
Digital-output cardiometer measures rapid changes in heartbeat rate MSC-133	B65-10143	01		
<b>NOSE CONE</b>				
High purity electroforming yields superior metal models ARC-6	B63-10007	05		
<b>NOTCH</b>				
Apparatus of small size can be extended into long, rigid boom JPL-305	B63-10200	05		
<b>NOZZLE</b>				
Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application LANGLEY-6A	B63-10318	03		
Improved technique for localizing electro- polishing features novel nozzles WOO-101	B64-10271	01		
<b>NOZZLE FLOW</b>				
Flow control valve is independent of pressure drop JPL-WOO-039	B65-10121	05		
<b>NUCLEAR HEAT</b>				
Servo calorimeter measures material heating rate NU-0024	B65-10247	01		
<b>NUCLEAR PARTICLE</b>				
Instrument performs nondestructive chemical analysis, data can be telemetered JPL-SC-078	B65-10317	01		

SUBJECT INDEX

<b>NUTS AND BOLTS</b>				Ellipsoidal optical reflectors reproduced by electroforming GSFC-92	B63-10547	05
Simple mechanism combines positive locking and quick-release features W00-4	B63-10420	05		Plastic films for reflective surfaces reproduced from masters GSFC-188	B64-10151	03
Instrument adjustment knob locks to prevent accidental maladjustment M-FS-190	B64-10249	05		Micromachining produces optical apertures to micron dimensions GSFC-206	B64-10211	05
Captive nut fastener securely joins brittle materials NU-0008	B65-10245	05		Carbon-arc rod holder has long life, reduces arc splatter MSC-144	B65-10095	03
<b>NYLON</b>				Interferometer construction assures parallelism of critical components JPL-704	B65-10292	02
Portable flooring protects finished surfaces, is easily moved M-FS-15	B63-10387	05		Unique construction makes interferometer insensitive to mechanical stresses JPL-725	B65-10295	02
<b>O-RING SEAL</b>				Nickel solution prepared for precision electroforming W00-070	B65-10303	03
Reinforcement core facilitates O-ring installation W00-228	B65-10378	05		<b>OPTICAL METHOD</b>		
<b>OHMMETER</b>				Liquid-level meter has no moving parts M-FS-3	B63-10378	03
Ohmmeter senses depletion of lubricant in journal bearings LEWIS-37	B64-10042	01		<b>OPTICAL PATH</b>		
Continuity tester screens out faulty socket connections JPL-596	B64-10065	01		Photoelectric system continuously monitors liquid level M-FS-417	B65-10382	01
Electronic ohmmeter provides direct digital output GSFC-363	B65-10274	01		<b>OPTICAL PROPERTY</b>		
<b>OIL</b>				Optical output enhances flowmeter accuracy M-FS-482	B65-10395	02
Oil-smearred models aid wind tunnel measurements LANGLEY-4	B63-10311	03		<b>OPTICAL PUMPING</b>		
Fine-particle filter prevents damage to vacuum pumps LEWIS-106	B63-10489	05		Magnetometer measures orthogonal components of magnetic fields GSFC-395	B65-10315	01
<b>OLEFIN</b>				<b>OPTICAL PYROMETER</b>		
Variable-transparency wall regulates temperatures of structures LANGLEY-25	B63-10528	03		Infrared shield facilitates optical pyrometer measurements LANGLEY-133	B65-10272	02
<b>OMNIDIRECTIONAL ANTENNA</b>				<b>OPTICAL REFLECTIVITY</b>		
Lightweight load support serves as vibration damper JPL-661	B65-10144	05		System measures angular displacement without contact LANGLEY-46	B65-10073	01
<b>OPACITY</b>				<b>OPTICAL SENSOR</b>		
Opaque microfiche masthead permits easy reading HQ-7	B65-10306	01		Low-cost tape system measures velocity of acceleration GSFC-85	B63-10512	01
<b>OPTICAL CORRECTION PROCEDURE</b>				<b>OPTICS</b>		
Oil-damped mercury pool makes precise optical alignment tool GSFC-353	B65-10253	02		Attachment converts microscope to point source autocollimator JPL-499	B64-10124	05
<b>OPTICAL EQUIPMENT</b>				Simple optical system used to align spectrograph LANGLEY-92	B65-10071	02
Computer programs simplify optical system analysis GSFC-306	B65-10093	01		System measures angular displacement without contact LANGLEY-46	B65-10073	01
Light ray modulation controls optical system alignment GFSC-171	B65-10211	02		<b>ORIFICE</b>		
<b>OPTICAL FILTER</b>				Elastic orifice automatically regulates gas bearings JPL-135	B63-10123	05
Thin transparent films formed from powdered glass GSFC-352	B65-10217	03		Modified gas bearing is adjustable to optimum stiffness ratio M-FS-145	B64-10050	05
<b>OPTICAL INSTRUMENT</b>				Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114	05
Optics used to measure torque at high rotational speeds LEWIS-13	B63-10338	01		<b>OSCILLATION</b>		
Mirror device aligns machine surface perpendicular to sight lines W00-5	B63-10421	02		Device enables measurement of moments of		

SUBJECT INDEX

inertia about three axes GSFC-49	B65-10176	05		
<b>OSCILLATION FREQUENCY</b> Circuit converts AM signals to FM for magnetic recording GSFC-227	B65-10001	01		
<b>OSCILLATOR</b> Increased performance reliability obtained with dual /redundant/ oscillator system GSFC-36	B63-10027	01		
Frequency-shift-keyer circuit improves PCM conversion for radio transmission GSFC-80	B63-10511	01		
Transistorized trigger circuit is frequency- controllable GSFC-111	B63-10553	01		
Highly efficient square-wave oscillator oper- ator at high power levels GSFC-112	B63-10554	01		
Computer determines high-frequency phase stability GSFC-113	B63-10555	01		
Blocking oscillator uses low triggering voltage MSC-58	B64-10017	01		
Electronic device simulates respiration rate and depth MSC-89	B64-10255	01		
Voltage generator sweeps oscillator frequency linearly with time M-FS-219	B64-10320	01		
FM oscillator uses tetrode transistor JPL-82	B65-10055	01		
Feedback oscillator functions as low-level pulse stretcher GSFC-261	B65-10069	01		
Unijunction frequency divider is free of backward loading JPL-W00-010	B65-10112	01		
Variable frequency transistor inverters use multiple core transformers variable frequency transistor inverters use multiple core transformers GSFC-183	B65-10119	01		
Circuit reduces distortion of FM modulator GSFC-257	B65-10152	01		
DC to AC converter operates efficiency at low input voltages GSFC-130	B65-10178	01		
Voltage variable oscillator has high phase stability LANGLEY-123	B65-10204	01		
Oscillator circuit measures liquid level in tanks M-FS-245	B65-10209	01		
Voltage controlled oscillator is easily aligned, has low phase noise JPL-510	B65-10223	01		
Electrostatically driven dynamic capacitor employs capacitive feedback JPL-771	B65-10293	01		
Frequency correction device uses digital circuitry GSFC-268	B65-10307	01		
Hybrid circuit achieves pulse regeneration with low power drain GSFC-382	B65-10314	01		
			<b>OSCILLOGRAPH</b>	
			Manual-feed adapter permits microfilming of continuous oscillograph output NU-0029	B65-10249 01
			<b>OUTPUT</b>	
			Double-throw microwave device switches two lines quickly JPL-410	B63-10258 01
			Simple circuit provides adjustable voltage with linear temperature variation JPL-W00-029	B63-10537 01
			Transistorized converter provides nondissipa- tive regulation GSFC-238	B64-10305 01
			Voltage generator sweeps oscillator frequency linearly with time M-FS-219	B64-10320 01
			Stepping motor drive circuit designed for low power drain GSFC-198	B65-10026 01
			Digital-output cardiometer measures rapid changes in heartbeat rate MSC-133	B65-10143 01
			Sensitive electrometer features digital output GSFC-288	B65-10206 01
			Frequency divider is free of spurious outputs GSFC-308	B65-10334 01
			Binary counter uses fluid logic elements M-FS-323	B65-10377 01
			<b>OXIDATION</b>	
			Cryopumping of hydrogen in vacuum chambers is aided by catalytic oxidation of hydrogen LEWIS-15	B63-10340 05
			<b>OXIDE</b>	
			Reference black body is compact, convenient to use ARC-3	B63-10004 03
			Removable preheater elements improve oxide induction furnace JPL-288	B63-10193 01
			<b>OXYGEN</b>	
			Miniature oxygen-hydrogen cutting torch constructed from hypodermic needle JPL-545	B63-10517 05
			<b>OXYGEN APPARATUS</b>	
			Respiratory transfer value has fail-safe feature ARC-1	B65-10369 01
			<b>OXYGEN BREATHING</b>	
			Respiratory transfer value has fail-safe feature ARC-1	B65-10369 01
			<b>OXYGEN DETECTOR</b>	
			Fuel cell serves as oxygen level detector JPL-SC-072	B65-10066 01
			<b>OZONE</b>	
			Porous glass makes effective substrate for ozone-sensing reagent GSFC-388	B65-10364 03
			<b>P</b>	
			<b>P-N-P JUNCTION</b>	
			Two-stage emitter follower is temperature stabilized MSC-20	B63-10493 01
			<b>PACKAGING</b>	
			Modular chassis simplifies packaging and interconnecting of circuit boards JPL-236A	B63-10174 01

SUBJECT INDEX

New package for belleville spring permits rate change, easy disassembly JPL-392	B63-10247	05	Boron trifluoride nuclear detector preamplifier uses single-cable connection LEWIS-178	B65-10255	01
Lightweight magnesium-lithium alloys show promise M-FS-17	B63-10389	03	<b>PARTICLE MASS</b> Microparticle impact sensor measures energy directly GSFC-252	B65-10048	01
Use of tear ring permits repair of sealed module circuitry M-FS-210	B65-10014	05	<b>PARTICLE PROPERTY</b> Probe samples components of rocket engine exhaust M-FS-485	B65-10384	03
Library of documents compressed into lap-held display kit MSC-125	B65-10030	01	<b>PARTICULATE FILTER</b> Fine-particle filter prevents damage to vacuum pumps LEWIS-106	B63-10489	05
Hollow plastic hoops protect thermocouple in storage and handling NU-0023	B65-10256	05	<b>PAYLOAD</b> Speed-sensing device aids crane operators WS-4	B64-10006	05
Frequency discriminator with binary output eliminates tuned circuits M-FS-376	B65-10349	01	<b>PENDULUM</b> Seismic transducer measures small horizontal displacements M-FS-81	B65-10029	05
<b>PACKING DENSITY</b> PCM magnetic tape system efficiency records and reproduces data GSFC-375	B65-10311	01	<b>PENDULUM APPARATUS</b> Viscous-pendulum damper suppresses structural vibrations LANGLEY-45	B64-10272	05
<b>PAINT</b> Inorganic paint is durable, fireproof, easy to apply GSFC-366	B65-10156	03	Device enables measurement of moments of inertia about three axes GSFC-49	B65-10176	05
Aluminum alloys protected against stress-corrosion cracking M-FS-235	B65-10172	03	<b>PENETRATING PARTICLE</b> Improved sensor counts micrometeoroid penetrations LEWIS-76	B63-10443	01
Special coatings control temperature of structures GSFC-444	B65-10337	03	<b>PHASE</b> Computer determines high-frequency phase stability GSFC-113	B63-10555	01
<b>PANEL</b> Portable display paneling has wide use, easy take down and assembly ARC-17	B63-10435	05	<b>PHASE DETECTOR</b> Phase detector circuit synthesizes own reference signal M-FS-247	B65-10080	01
Electronic assembly rack panels snap on and off GSFC-59	B64-10121	05	<b>PHASE SHIFT</b> Phase shift frequency synthesizer is efficient, small in size M-FS-250	B65-10169	01
Instrument adjustment knob locks to prevent accidental maladjustment M-FS-190	B64-10249	05	<b>PHOTOCONDUCTIVE CELL</b> Solar-angle sensor has no moving parts JPL-418	B63-10260	02
Transducer senses displacements of panels subjected to vibration ARC-37	B65-10085	01	<b>PHOTOCONDUCTOR</b> Light-sensitive potentiometer measures product of two variables GSFC-240	B65-10076	01
Galvanic corrosion reduced in aluminum fabrications M-FS-272	B65-10140	03	<b>PHOTODIODE</b> Simple circuit positions film frames in projector JPL-508	B65-10132	02
Integral ribs formed in metal panels by cold-press extrusion M-FS-230	B65-10141	05	Instrument calibrates low gas-rate flowmeters MSC-134	B65-10137	01
<b>PARABOLIC REFLECTOR</b> Unique construction makes interferometer insensitive to mechanical stresses JPL-725	B65-10295	02	Laser beam transmits electric power GSFC-293	B65-10158	01
<b>PARABOLOIDAL MIRROR</b> Wide-aperture solar energy collector is light in weight JPL-SC-055	B65-10046	02	Photoresistance analog multiplier has wide range GSFC-360	B65-10287	01
<b>PARTICLE</b> Fine-mesh screen made by simplified method WOO-104	B64-10282	03	<b>PHOTOELASTIC STRESS MEASUREMENT</b> Servo system facilitates photoelastic strain measurements on resins JPL-504	B64-10280	01
<b>PARTICLE DETECTOR</b> Microparticle impact sensor measures energy directly GSFC-252	B65-10048	01	<b>PHOTOELECTRIC APPARATUS</b> Liquid-level meter has no moving parts M-FS-3	B63-10378	03
Multiaxial analyzer detects low-energy electrons GSFC-329	B65-10213	01			

SUBJECT INDEX

Photoelectric semiconductor switch operates with low level inputs JPL-SC-068	B65-10033	01	PIEZOELECTRIC CRYSTAL Piezoresistive gage tests pin-connector sockets JPL-675	B65-10128	01
<b>PHOTOELECTRIC CELL</b> Solar-angle sensor has no moving parts JPL-418	B63-10260	02	Crystal measures short-term, large-magnitude forces JPL-77	B65-10187	01
New method used to fabricate gallium arsenide photovoltaic device W00-062	B64-10019	01	<b>PIEZOELECTRICITY</b> Device calibrates vibration transducers at amplitudes up to 20 G. M-FS-86	B63-10572	01
Sensitive level sensor made with spirit level, gives electrical output LANGLEY-49	B65-10067	01	Ultra-sensitive transducer advances micro-measurement range ARC-26	B64-10004	01
Photoelectric system continuously monitors liquid level M-FS-417	B65-10382	01	Pressure transducer 3/8-inch in size can be faired into surface W00-065	B64-10021	05
<b>PHOTOGRAPH</b> Built-in templates speed up process for making accurate models LANGLEY-23	B63-10526	05	<b>PIEZORESISTIVE DEVICE</b> Pressure transducer 3/8-inch in size can be faired into surface W00-065	B64-10021	05
Use of photographs speeds inspection of printed-circuit boards MSC-72	B64-10118	01	Miniature stress transducer has directional capability JPL-591	B65-10023	01
<b>PHOTOGRAPHIC APPARATUS</b> New low-level AC amplifier provides adjustable noise cancellation and automatic temperature compensation MSC-108	B65-10003	05	<b>PIGMENT</b> Pigmented coating resists thermal shock JPL-SC-083	B65-10354	03
Nulling pyrometer uses KERR cell shutter for fast responses NU-0010	B65-10050	01	<b>PIPE</b> Spring loaded beaded cable makes efficient wire puller W00-108	B65-10031	05
Rotating filters permit wide range of optical pyrometry LANGLEY-33	B65-10100	02	Portable tool removes burrs from pipe and tubing MSC-237	B65-10360	05
Simple circuit positions film frames in projector JPL-508	B65-10132	02	Portable tool cleans pipes and tubing MSC-238	B65-10375	05
Planetary camera control improves microfiche production HQ-1	B65-10313	01	<b>PIPELINE</b> Special pliers connect hose containing liquid under pressure JPL-IT-1003	B63-10291	05
<b>PHOTOGRAPHIC DEVELOPER</b> Modified developer increases line resolution in photosensitive resist GSFC-386	B65-10278	01	Blade valve isolates compartment in pipe, opens to allow free flow JPL-585	B64-10188	05
<b>PHOTOGRAPHY</b> Front and back printed circuit layouts presented on single sheet GSFC-93	B63-10596	01	<b>PISTON</b> Vented piston seal prevents fluid leakage between two chambers JPL-179	B63-10141	05
<b>PHOTOMULTIPLIER</b> Variable light source with a million-to-one intensity ratio JPL-W00-008	B63-10424	03	Inexpensive check valve is installed in standard AN fittings JPL-2A	B65-10222	05
System selects framing rate for spectrograph camera LANGLEY-55	B65-10086	01	<b>PIVOT</b> Solenoid permits remote control of stop watch and assures restarting FRC-17	B63-10024	01
<b>PHOTOVOLTAIC EFFECT</b> Pressure transducer 3/8-inch in size can be faired into surface W00-065	B64-10021	05	<b>PLASMA</b> Microwave technique measures plasma characteristics LANGLEY-134	B65-10122	02
<b>PHYSICAL PROPERTY</b> Tiny sensor-transmitter can withstand extreme acceleration, gives digital output ARC-22	B63-10561	01	<b>PLASMA ACCELERATOR</b> Pulsed plasma accelerator operates repetitively without complex controls LANGLEY-48	B65-10062	01
<b>PHYSIOLOGICAL TELEMETRY</b> Analog device simulates physiological waveforms MSC-51	B64-10109	01	<b>PLASMA JET</b> Carbon arc ignition improved by simple auxiliary circuit MSC-103	B65-10018	01
<b>PHYSIOLOGY</b> Test monkeys anesthetized by routine procedure HQ-18	B65-10332	04	<b>PLASTIC</b> Mechanical properties of plastics predetermined by empirical method ARC-28	B64-10068	03

SUBJECT INDEX

Improved holder protects crystal during high acceleration and impact JPL-463	B65-10037	05	in RF cable WOO-207	B65-10387	01
Epoxy-resin patterns speed shell-molding of aluminum parts M-FS-303	B65-10177	05	<b>PLASTICIZER</b> Mechanical properties of plastics predetermined by empirical method ARC-28	B64-10068	03
Organic reactants rapidly produce plastic foam LANGLEY-37	B65-10288	03	<b>PLATE</b> Device transmits rotary motion through hermetically sealed wall JPL-303	B63-10198	05
Drill bit design assures clean holes in laminated materials WOO-098	B65-10386	05	Lightweight universal joint transmits both torque and thrust JPL-375	B63-10236	05
<b>PLASTIC COATING</b> Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application LANGLEY-6A	B63-10318	03	Simple mechanism combines positive locking and quick-release features WOO-4	B63-10420	05
Flexible magnetic planning boards are easily transported M-FS-340	B65-10219	05	Unmanned seismometer levels self, corrects drift errors GSFC-100	B63-10551	01
<b>PLASTIC DEFORMATION</b> Plastic plus stainless-steel fibers make resilient, impermeable material WOO-246	B65-10374	03	Splice plate design assures structural separation by mild explosive MSC-137	B65-10166	05
<b>PLASTIC FILM</b> Plastic films for reflective surfaces reproduced from masters GSFC-188	B64-10151	03	<b>PLATFORM</b> Apparatus measures very small thrusts WOO-048	B64-10284	05
Thermistor connector assembly increases accuracy of measurements LANGLEY-62	B65-10045	01	<b>PLATING</b> Adherent protective coatings plated on magnesium-lithium alloy M-FS-365	B65-10294	03
<b>PLASTIC MATERIAL</b> Portable flooring protects finished surfaces, is easily moved M-FS-15	B63-10387	05	Plated nickel wire mesh makes superior catalyst bed MSC-216	B65-10321	03
A technique for making animal restraints ARC-25	B63-10564	05	<b>PLENUM CHAMBER</b> Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114	05
Plastic molds reduce cost of encapsulating electric cable connectors M-FS-69	B63-10568	05	<b>PLOTTING</b> Veitch diagram plotter simplifies boolean functions JPL-385	B63-10241	05
Cryogenic waveguide window is sealed with plastic foam JPL-559	B63-10613	01	Polychart contour enables data extrapolation from multiple plotting charts M-FS-37	B64-10406	05
Mechanical properties of plastics predetermined by empirical method ARC-28	B64-10068	03	<b>PLOTTING INSTRUMENT</b> Polychart contour enables data extrapolation from multiple plotting charts M-FS-37	B64-10406	05
New low-level AC amplifier provides adjustable noise cancellation and automatic temperature compensation MSC-108	B65-10003	05	Variable load automatically tests dc power supplies GSFC-291	B65-10105	01
Vapor pressure measured with inflatable plastic bag GSFC-281	B65-10136	03	<b>PLUG</b> Design of valve permits sealing even if the stem is misaligned LEWIS-38	B63-10341	05
Inexpensive electrical connector is moisture and corrosionproof MSC-164	B65-10196	01	Circuit reliability boosted by soldering pins of disconnect plugs to sockets JPL-447	B64-10002	01
Inert-gas welding and brazing enclosure fabricated from sheet plastic LEWIS-220	B65-10338	05	Keyed plugs and sockets prevent improper connections MSC-231	B65-10381	01
Flexible plastic ring assembly makes durable shaft seal WOO-227	B65-10367	05	<b>PNEUMATIC EQUIPMENT</b> Pneumatic power is transmitted through air bearing MSC-8	B64-10141	05
Plastic plus stainless-steel fibers make resilient, impermeable material WOO-246	B65-10374	03	Electropneumatic rheostat regulates high current ARC-44	B65-10299	01
Device detects unbonded areas in plastic laminates WOO-206	B65-10380	01	<b>PNEUMOGRAPHY</b> Electronic device simulates respiration rate		
Shrinkable sleeve eliminates shielding gap					

SUBJECT INDEX

and depth MSC-89	B64-10255	01	<b>PORTABILITY</b> Portable flooring protects finished surfaces, is easily moved M-FS-15	B63-10387	05
Pneumotachometer counts respiration rate of human subject MSC-92	B64-10259	01	Portable display paneling has wide use, easy take down and assembly ARC-17	B63-10435	05
<b>POLARIZATION</b> Circuit switches latching relay in response to signals of different polarity WOO-055	B63-10508	01	<b>POSITIONING</b> Three-position rocker switch actuator has positive centering MSC-261	B65-10376	01
Nulling pyrometer uses KERR cell shutter for fast responses NU-0010	B65-10050	01	<b>POSITIONING EQUIPMENT</b> Screw locking cups quickly and neatly crimped NU-0009	B65-10049	05
Magnetic field controls carbon arc tail flame MSC-139	B65-10108	01	<b>POTASSIUM SILICATE</b> Inorganic paint is durable, fireproof, easy to apply GSFC-366	B65-10156	03
<b>POLE</b> Threading hook facilitates safe recovery of heavy loads MSC-46	B64-10185	05	<b>POTENTIOMETER</b> Tension is servo controlled in film advance system LANGLEY-54	B65-10075	05
<b>POLISHING</b> Improved technique for localizing electro- polishing features novel nozzles WOO-101	B64-10271	01	Light-sensitive potentiometer measures product of two variables GSFC-240	B65-10076	01
Portable tool cleans pipes and tubing MSC-238	B65-10375	05	Simple circuit reduces transistor switching time GSFC-314	B65-10234	01
<b>POLYAMIDE</b> Aluminum alloys protected against stress- corrosion cracking M-FS-235	B65-10172	03	<b>POWDERED METAL</b> Modified filter prevents conduction of micro- wave signals along high-voltage power supply leads JPL-63	B63-10091	01
<b>POLYESTER</b> Irradiation improves properties of an aromatic polyester LANGLEY-115	B65-10164	03	<b>POWER GAIN</b> New apparatus increases ion beam power density LEWIS-73	B63-10440	01
<b>POLYESTER RESIN</b> Modified filter prevents conduction of micro- wave signals along high-voltage power supply leads JPL-63	B63-10091	01	<b>POWER SUPPLY</b> Igniting system for mercury vapor lamps pro- tects transistorized sustaining supply JPL-421	B63-10262	01
<b>POLYMER</b> Metals plated on fluorocarbon polymers JPL-544	B63-10612	03	ptc thermistor protects multiloaded power supplies GSFC-236	B64-10281	01
Encapsulation process sterilizes and preserves surgical instruments JPL-484	B64-10066	05	Zener diode is starter for transistor- regulated power supply NU-0015	B65-10052	01
Low-cost seal compensates for surface irregularities NU-0016	B65-10160	05	Variable voltage supply uses zener diode as reference GSFC-262	B65-10097	01
Electronic modules easily separated from heat sink MSC-142	B65-10186	02	Variable load automatically tests dc power supplies GSFC-291	B65-10105	01
<b>POLYMETHYL METHACRYLATE</b> Spherical model provides visual aid for cubic crystal study LEWIS-108	B65-10065	03	DC to AC converter operates efficiency at low input voltages GSFC-130	B65-10178	01
<b>POLYSTYRENE</b> Small foamed polystyrene shield protects low- frequency microphones from wind noise M-FS-123	B63-10579	01	Modular thermoelectric cell is easily packaged in various arrays GSFC-339	B65-10199	01
Cryogenic waveguide window is sealed with plastic foam JPL-559	B63-10613	01	Improved wire memory matrix uses very little power JPL-SC-167	B65-10359	01
<b>POROSITY</b> Apparatus facilitates pressure-testing of metal tubing LEWIS-174	B65-10131	05	<b>POWER TRANSMISSION</b> Laser beam transmits electric power GSFC-293	B65-10158	01
<b>POROUS MATERIAL</b> Porous glass makes effective substrate for ozone-sensing reagent GSFC-388	B65-10364	03	System transmits mechanical vibration into hazardous environment NU-0025	B65-10248	05
			<b>PREAMPLIFIER</b> Auxiliary circuit enables automatic monitoring		

SUBJECT INDEX

of EKG MSC-106	B65-10142	01		
Boron trifluoride nuclear detector preamplifier uses single-cable connection LEWIS-178	B65-10255	01		
Electrometer preamplifier has drift correction feedback JPL-SC-074	B65-10267	01		
<b>PRECIPITATION</b> Crack detection method is safe in presence of liquid oxygen M-FS-236	B65-10107	03		
<b>PRESSING</b> Rapid billet loader aids extrusion of refrac- tory metals LEWIS-50	B63-10354	05		
<b>PRESSURE</b> High-pressure regulating system prevents pressure surges JPL-231	B63-10170	05		
Special pliers connect hose containing liquid under pressure JPL-IT-1003	B63-10291	05		
Device induces lungs to maintain known constant pressure MSC-50	B64-10108	04		
Pulsed plasma accelerator operates repetitively without complex controls LANGLEY-48	B65-10062	01		
Electrically heated diaphragm eliminates use of pyrotechnics MSC-241	B65-10400	01		
<b>PRESSURE APPARATUS</b> Upsetting butt edge increases weld-joint strength M-FS-175	B64-10164	05		
Apparatus facilitates pressure-testing of metal tubing LEWIS-174	B65-10131	05		
Inflatable bladder provides accurate calibration of pressure switch M-FS-367	B65-10279	01		
<b>PRESSURE CHAMBER</b> Vented piston seal prevents fluid leakage between two chambers JPL-179	B63-10141	05		
<b>PRESSURE DROP</b> Universal bellows joint restraint permits angular and offset movement WOO-102	B65-10371	05		
<b>PRESSURE EFFECT</b> Pressure responsive seal handles static and dynamic loads GSFC-441	B65-10327	05		
<b>PRESSURE GAUGE</b> Rapid helium-air analyzer can measure other binary gas mixtures LANGLEY-16	B63-10557	03		
Pickup device reads pressures from ports in rotating mechanisms LEWIS-158	B65-10021	05		
Differential pressure gauge has fast response M-FS-358	B65-10285	05		
<b>PRESSURE GRADIENT</b> Packless valve with all-metal seal handles wide temperature, pressure range JPL-361	B63-10228	05		
Density trace made with computer printout GSFC-322	B65-10200	01		
			<b>PRESSURE MEASUREMENT</b>	
			Improved variable-reluctance transducer meas- ures transient pressures LANGLEY-10	B63-10321 01
			Fluid-pressure meter can be calibrated without removal from flow line M-FS-98	B63-10502 05
			Precision gage measures ultrahigh vacuum levels GSFC-114	B63-10597 01
			Multiple port pressure scanner valve features greater accuracy, quicker data JPL-555	B64-10031 05
			Fluid-pressure measurement apparatus uses short-length manometer tubes LEWIS-28	B65-10027 05
			Apparatus measures swelling of membranes in electrochemical cells GSFC-280	B65-10087 01
			Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114 05
			Vapor pressure measured with inflatable plastic bag GSFC-281	B65-10136 03
			Differential pressure gauge has fast response M-FS-358	B65-10285 05
			Remote rapidly varying pressures accurately measured FRC-28	B65-10301 01
			<b>PRESSURE RECORDER</b> Pressure transducer system is force-balanced, has digital output M-FS-154	B65-10174 05
			<b>PRESSURE REGULATOR</b> High-pressure regulating system prevents pressure surges JPL-231	B63-10170 05
			Pressure transducer system is force-balanced, has digital output M-FS-154	B65-10174 05
			<b>PRESSURE RELIEF VALVE</b> One-shot valve may be remotely actuated WOO-195	B65-10266 05
			<b>PRESSURE TRANSDUCER</b> Improved variable-reluctance transducer meas- ures transient pressures LANGLEY-10	B63-10321 01
			Welded pressure transducer made as small as 1/8th-inch in diameter ARC-11	B63-10429 03
			Fluid-pressure meter can be calibrated without removal from flow line M-FS-98	B63-10502 05
			Pressure transducer 3/8-inch in size can be faired into surface WOO-065	B64-10021 05
			Multiple port pressure scanner valve features greater accuracy, quicker data JPL-555	B64-10031 05
			Metal diaphragm used to calibrate miniature transducers M-FS-207	B65-10059 01
			Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114 05
			Pressure transducer system is force-balanced, has digital output	

SUBJECT INDEX

M-FS-154	B65-10174	05	<b>PROTECTIVE CLOTHING</b>		
Pressure sensor responds only to shock wave			Double gloves reduce contamination of dry box atmosphere		
M-FS-238	B65-10184	01	LEWIS-211	B65-10117	03
Direct force-measuring transducer used in blood pressure research			<b>PROTECTIVE COATING</b>		
ARC-53	B65-10325	01	Solder flux leaves corrosion-resistant coating on metal		
<b>PRESSURE TUBE</b>			JPL-611	B64-10206	03
Remote rapidly varying pressures accurately measured			Burnishing technique improves lubrication of threaded fasteners		
FRC-28	B65-10301	01	LEWIS-217	B65-10302	03
<b>PRESSURE VESSEL</b>			<b>PROTRACTOR</b>		
Method of welding joint in closed vessel improves quality of seam			Setting of angles on machine tools speeded by magnetic protractor		
JPL-170	B63-10139	05	ARC-5	B63-10006	01
Lightweight door seals cryogenic container against diaphragm type loading			<b>PULLEY</b>		
M-FS-476	B65-10402	05	Chain friction system gives positive, reversible drive		
<b>PRESSURIZATION</b>			ARC-8	B63-10009	05
Low-cost insulation system for cryostats eliminates need for a vacuum			Apparatus alters position of objects to facilitate demagnetization		
LEWIS-64	B63-10365	03	GSFC-234	B64-10277	05
<b>PRINTED CIRCUIT</b>			<b>PULSE</b>		
Modular chassis simplifies packaging and interconnecting of circuit boards			Pulsed plasma accelerator operates repetitively without complex controls		
JPL-236A	B63-10174	01	LANGLEY-48	B65-10062	01
Front and back printed circuit layouts presented on single sheet			Auxiliary circuit enables automatic monitoring of EKG		
GSFC-93	B63-10596	01	MSC-106	B65-10142	01
Compact coaxial connector for printed circuit adds reliability			<b>PULSE AMPLITUDE</b>		
MSC-57	B64-10016	01	Simple device produces accelerometer calibration pulse		
Use of photographs speeds inspection of printed-circuit boards			M-FS-363	B65-10269	01
MSC-72	B64-10118	01	<b>PULSE CODE MODULATION /PCM/</b>		
Handtool bends component leads accurately			Frequency-shift-keyer circuit improves PCM conversion for radio transmission		
M-FS-308	B65-10181	05	GSFC-80	B63-10511	01
<b>PRINTER</b>			PCM magnetic tape system efficiency records and reproduces data		
Density trace made with computer printout			GSFC-375	B65-10311	01
GSFC-322	B65-10200	01	<b>PULSE DURATION MODULATION /PDM/</b>		
Uppercase and lowercase computer printout increases readability			Novel circuit combines pulse stretcher with NOR gate		
HQ-12	B65-10286	01	GSFC-187	B64-10150	01
<b>PRISM</b>			<b>PULSE FREQUENCY MODULATION /PFM/</b>		
Liquid-level meter has no moving parts			Simple circuit functions as frequency discriminator for PFM signals		
M-FS-3	B63-10378	03	GSFC-267	B65-10102	01
<b>PROBABILITY DISTRIBUTION</b>			<b>PULSE HEIGHT</b>		
Hybrid computer technique yields random signal probability distributions			Pulse height analyzer operates at high repetition rates, low power		
ARC-34	B65-10208	01	W00-046	B65-10041	01
<b>PROBE</b>			Instrument performs nondestructive chemical analysis, data can be telemetered		
Cooling method prolongs life of hot-wire transducer			JPL-SC-078	B65-10317	01
LEWIS-41	B63-10344	02	<b>PULSE MODULATION</b>		
<b>PROJECTION</b>			Efficient circuit triggers high-current, high-voltage pulses		
Use of photographs speeds inspection of printed-circuit boards			MSC-14	B64-10024	01
MSC-72	B64-10118	01	Frequency divider is free of spurious outputs		
Disk calculator indicates legible lettering size for slide projection			GSFC-308	B65-10334	01
GSFC-409	B65-10339	05	<b>PULSE MOTOR</b>		
<b>PROPAGATION MODE</b>			Magnetic-shift-register circuit controls step motor operations		
Novel horn antenna reduces side lobes, improves radiation pattern			GSFC-340	B65-10226	01
JPL-425	B63-10264	01	<b>PULSE RECORDER</b>		
<b>PROPAGATION VELOCITY</b>			Simple BCD circuit accurately counts to 24		
Improved circuit minimizes generation of pseudonoise check bits			GSFC-317	B65-10225	01
JPL-698	B65-10275	01	<b>PULSE TRANSMISSION SYSTEM</b>		
			Tiny sensor-transmitter can withstand extreme		

SUBJECT INDEX

acceleration, gives digital output ARC-22	B63-10561	01		
Simple pulse counting circuit computes sum of squares GSFC-391	B65-10260	01		
Frequency correction device uses digital circuitry GSFC-268	B65-10307	01		
<b>PULSE WIDTH</b> Simple circuit produces high-speed, fixed duration pulses GSFC-285	B65-10228	01		
Threshold detector produces narrow pulses at high repetition rates GSFC-363	B65-10310	01		
<b>PULSED GENERATOR</b> Pulse generator permits nondestructive testing of component breakdown voltage MSC-122	B65-10054	01		
Synchronized pulse generator needs no external power GSFC-274	B65-10072	01		
Hybrid circuit achieves pulse regeneration with low power drain GSFC-382	B65-10314	01		
Multiphase clock-pulse generator uses simplified circuitry M-FS-297	B65-10353	01		
<b>PUMP</b> Level of super-cold liquids automatically maintained by levelometer JPL-397	B63-10250	01		
Fine-particle filter prevents damage to vacuum pumps LEWIS-106	B63-10489	05		
Heater decomposes oil backstreaming from high-vacuum pumps GSFC-356	B65-10224	02		
Flexible plastic ring assembly makes durable shaft seal WOO-227	B65-10367	05		
<b>PUNCH</b> Die and telescoping punch form convolutions in thin diaphragm JPL-SC-135	B65-10393	05		
<b>PURIFICATION</b> Cryogenic filter method produces super-pure helium and helium isotopes JPL-374	B63-10235	03		
Ceramic materials purified by experimental method LEWIS-225	B65-10270	03		
<b>PYROLYSIS</b> Nitrogen dioxide produced by self-sustained pyrolysis of nitrous oxide LANGLEY-32	B65-10074	05		
<b>PYROMETER</b> Nulling pyrometer uses KERR cell shutter for fast responses NU-0010	B65-10050	01		
<b>PYROMETRY</b> Rotating filters permit wide range of optical pyrometry LANGLEY-33	B65-10100	02		
<b>PYROTECHNICS</b> Electrically heated diaphragm eliminates use of pyrotechnics MSC-241	B65-10400	01		
			<b>R</b>	
			<b>RADAR EQUIPMENT</b> Circuit converts AM signals to FM for magnetic recording GSFC-227	B65-10001 01
			<b>RADAR SYSTEM</b> FM/CW system measures aircraft attitude M-FS-276	B65-10290 01
			<b>RADIANT ENERGY</b> Wide-angle sensor measures radiant heat energy in corrosive atmospheres M-FS-228	B65-10019 05
			<b>RADIANT HEATING</b> Radiant heater for vacuum furnaces offers high structural rigidity, low heat loss LEWIS-39	B63-10342 01
			Graphite element serves as radiant heat source M-FS-105	B65-10218 01
			<b>RADIATION ABSORPTION</b> Flange on microwave antenna subreflector cuts ground noise JPL-362	B63-10229 01
			<b>RADIATION DETECTOR</b> Radiation detector-optical hanging device is of simplified construction GSFC-251	B64-10299 01
			<b>RADIATION DISTRIBUTION</b> Novel horn antenna reduces side lobes, improves radiation pattern JPL-425	B63-10264 01
			Polychart contour enables data extrapolation from multiple plotting charts M-FS-37	B64-10406 05
			<b>RADIATION EFFECT</b> Irradiation improves properties of an aromatic polyester LANGLEY-115	B65-10164 03
			<b>RADIATION FIELD</b> Fluid pressure used to test turbopump bearings NU-0001	B65-10024 03
			<b>RADIATION SHIELDING</b> Refractory metal shielding /insulation/ increases operating range of induction furnace LEWIS-202	B65-10188 02
			<b>RADIATION SOURCE</b> Multiple element soft X-ray source produces wide range of radiation GSFC-286	B65-10082 02
			<b>RADIATOR</b> Graphite element serves as radiant heat source M-FS-105	B65-10218 01
			<b>RADIO COMMUNICATION</b> Comfortable, lightweight safety helmet holds radio transmitter, receiver MSC-53	B64-10015 05
			<b>RADIO EQUIPMENT</b> Added diodes increase output of balanced mixer circuit GSFC-354	B65-10276 01
			<b>RADIO FILTER</b> Helical coaxial-resonator makes excellent RF filter GSFC-243	B65-10012 01
			<b>RADIO FREQUENCY</b> Modified rf coaxial connector ends vacuum chamber wiring problem GSFC-150	B64-10010 01
			Solid-state laser transmitter is amplitude modulated	

SUBJECT INDEX

MSC-121	B65-10238	01	<b>REEL</b>		
<b>RADIO FREQUENCY SHIELDING</b>			Dispensing system eliminates torsion in		
Shrinkable sleeve eliminates shielding gap			deployed hoses		
in RF cable			MSC-80	B65-10185	05
WOO-207	B65-10387	01	<b>REFERENCE SYSTEM</b>		
<b>RADIO RECEIVER</b>			Reference black body is compact, convenient to		
Comfortable, lightweight safety helmet holds			use		
radio transmitter, receiver			ARC-3	B63-10004	03
MSC-53	B64-10015	05	<b>REFLECTION</b>		
<b>RADIO TRANSMITTER</b>			Attachment converts microscope to point source		
Comfortable, lightweight safety helmet holds			autocollimator		
radio transmitter, receiver			JPL-499	B64-10124	05
MSC-53	B64-10015	05	<b>REFLECTOR</b>		
<b>RAFT</b>			Flange on microwave antenna subreflector cuts		
New inflatable liferaft is nontippable			ground noise		
MSC-4A	B64-10001	05	JPL-362	B63-10229	01
<b>RANDOM SIGNAL</b>			Test device prevents molecular bounce-back		
Hybrid computer technique yields random			GSFC-82	B63-10546	03
signal probability distributions			<b>Ellipsoidal optical reflectors reproduced by</b>		
ARC-34	B65-10208	01	electroforming		
<b>RAY TRACING</b>			GSFC-92	B63-10547	05
Computer programs simplify optical system			<b>Plastic films for reflective surfaces</b>		
analysis			reproduced from masters		
GSFC-306	B65-10093	01	GSFC-188	B64-10151	03
<b>READOUT</b>			<b>Optical arrangement increases useful light</b>		
Optics used to measure torque at high			output of semiconductor diodes		
rotational speeds			JPL-SC-064	B65-10020	05
LEWIS-13	B63-10338	01	<b>Oil-damped mercury pool makes precise</b>		
<b>Low-cost tape system measures velocity of</b>			optical alignment tool		
acceleration			GSFC-353	B65-10253	02
GSFC-85	B63-10512	01	<b>Nickel solution prepared for precision</b>		
<b>Compact cartridge drives coded tape at</b>			electroforming		
constant readout speed			WOO-070	B65-10303	03
JPL-472	B64-10222	01	<b>Communication system uses modulated laser beam</b>		
<b>Simple pulse counting circuit computes sum</b>			GSFC-377	B65-10333	01
of squares			<b>REFRACTORY ALLOY</b>		
GSFC-391	B65-10260	01	New cobalt alloys have high-temperature		
<b>RECEIVER</b>			strength and long life in vacuum environments		
Tunnel-diode circuit features zero-level			LEWIS-47	B63-10351	03
clipping			<b>REFRACTORY MATERIAL</b>		
GSFC-241	B65-10002	01	Apparatus facilitates high-temperature tensile		
<b>Helical coaxial-resonator makes excellent</b>			testing in vacuum		
RF filter			LEWIS-42	B63-10345	03
GSFC-243	B65-10012	01	<b>Refractory ceramic has wide usage, low</b>		
<b>RECORDING INSTRUMENT</b>			fabrication cost		
Small digital recording head has parallel bit			M-FS-67	B63-10481	03
channels, minimizes cross talk			<b>Refractory thermal insulation for smooth</b>		
JPL-0029	B63-10284	01	metal surfaces		
<b>Improved electrode gives high-quality</b>			M-FS-160	B64-10099	03
biological recordings			<b>Refractory oxides evaluated for</b>		
MSC-17	B64-10025	04	high-temperature use		
<b>Manual-feed adapter permits microfilming of</b>			LANGLEY-121	B65-10167	03
continuous oscillograph output			<b>REFRACTORY METAL</b>		
NU-0029	B65-10249	01	Radiant heater for vacuum furnaces offers high		
<b>RECOVERY</b>			structural rigidity, low heat loss		
Organic reactants rapidly produce plastic foam			LEWIS-39	B63-10342	01
LANGLEY-37	B65-10288	03	<b>Rapid billet loader aids extrusion of refrac-</b>		
<b>RECOVERY DEVICE</b>			tory metals		
Scoop attachment makes helicopter recoveries			LEWIS-50	B63-10354	05
easier and safer			<b>Ceramic-coated boat is chemically inert,</b>		
MSC-130	B65-10229	05	provides good heat transfer		
<b>RECTIFIER</b>			LANGLEY-90	B65-10063	05
Emission tester for high-power vacuum tubes			<b>Apparatus facilitates pressure-testing of</b>		
JPL-628	B64-10158	01	metal tubing		
<b>REDUNDANT SYSTEM</b>			LEWIS-174	B65-10131	05
Logic redundancy improves digital system			<b>Brazing method produces solid-solution bond</b>		
reliability			between refractory metals		
JPL-SC-069	B65-10025	01	LEWIS-212	B65-10370	05

SUBJECT INDEX

<b>REFRIGERATION</b>				Knob linkage permits one-hand control of several operations			
New nut and sleeve improve flared connections				MSC-30	B65-10022	05	
M-FS-194	B65-10180	05					
<b>REGENERATOR</b>				Remotely operated clamping tool has positive grip			
Hybrid circuit achieves pulse regeneration with low power drain				NU-0020	B65-10254	05	
GSFC-382	B65-10314	01					
<b>REGULATOR</b>				Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application			
Elastic orifice automatically regulates gas bearings				Langley 6-A	B65-10318	01	
JPL-135	B63-10123	05		M-FS-380			
High-pressure regulating system prevents pressure surges					B65-10383	05	
JPL-231	B63-10170	05					
Zener diode is starter for transistor-regulated power supply							
NU-0015	B65-10052	01					
<b>REINFORCEMENT</b>				<b>REPAIR</b>			
Reinforcement core facilitates O-ring installation				Inert gas spraying device aids in repair of hazardous systems			
W00-228	B65-10378	05		LEWIS-8B	B65-10115	05	
<b>REINFORCING FIBER</b>				<b>REPEATER</b>			
Boron carbide whiskers produced by vapor deposition				Pulsed plasma accelerator operates repetitively without complex controls			
HQ-24	B65-10261	03		LANGLEY-48	B65-10062	01	
<b>RELAY</b>				<b>REPRODUCTION</b>			
Circuit switches latching relay in response to signals of different polarity				Front and back printed circuit layouts presented on single sheet			
W00-055	B63-10508	01		GSFC-93	B63-10596	01	
<b>RELEASE DEVICE</b>				Plastic films for reflective surfaces reproduced from masters			
Simple mechanism combines positive locking and quick-release features				GSFC-188	B64-10151	03	
W00-4	B63-10420	05					
Instrument adjustment knob locks to prevent accidental maladjustment				PCM magnetic tape system efficiency records and reproduces data			
M-FS-190	B64-10249	05		GSFC-375	B65-10311	01	
One-shot valve may be remotely actuated				<b>REPRODUCTIVE SYSTEM</b>			
W00-195	B65-10266	05		Modified procedure speeds camera copy layout for offset printing			
				GSFC-424	B65-10373	02	
<b>RELIABILITY</b>				<b>RESIN</b>			
Increased performance reliability obtained with dual /redundant/ oscillator system				Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application			
GSFC-36	B63-10027	01		LANGLEY-6A	B63-10318	03	
Circuit reliability boosted by soldering pins of disconnect plugs to sockets				Plastic molds reduce cost of encapsulating electric cable connectors			
JPL-447	B64-10002	01		M-FS-69	B63-10568	05	
Compact coaxial connector for printed circuit adds reliability				Servo system facilitates photoelastic strain measurements on resins			
MSC-57	B64-10016	01		JPL-504	B64-10280	01	
Circuit improvement produces monostable multivibrator with load-carrying capability				Compact assembly generates plastic foam, inflates flotation bag			
GSFC-34A	B65-10011	01		LANGLEY-96	B65-10090	05	
<b>RELIABILITY CONTROL</b>				<b>RESISTANCE</b>			
Increased performance reliability obtained with dual /redundant/ oscillator system				Refractory ceramic has wide usage, low fabrication cost			
GSFC-36	B63-10027	01		M-FS-67	B63-10481	03	
Composite, vacuum-jacketed tubing replaces bellows in cryogenic systems				Adhesive for vacuum environments resists shock and vibration			
LEWIS-67	B63-10368	05		MSC-56	B65-10016	03	
<b>RELIEF VALVE</b>				Selenium bond decreases On resistance of light-activated switch			
Sensitive low-pressure relief valve has positive seating against leakage				JPL-SC-101	B65-10324	01	
W00-041	B64-10278	05					
<b>REMOTE CONTROL</b>				<b>RESISTANCE HEATING</b>			
Solenoid permits remote control of stop watch and assures restarting				Removable preheater elements improve oxide induction furnace			
FRC-17	B63-10024	01		JPL-288	B63-10193	01	
Liquid switch is remotely operated by low DC voltage				Apparatus facilitates high-temperature tensile testing in vacuum			
GSFC-119	B63-10599	01		LEWIS-42	B63-10345	03	

SUBJECT INDEX

Electrically heated diaphragm eliminates use of pyrotechnics MSC-241	B65-10400	01	<b>RIGIDITY</b> Extendible column can be stowed on drum JPL-686	B65-10191	05
<b>RESISTOR</b> Highly efficient square-wave oscillator operator at high power levels GSFC-112	B63-10554	01	<b>RING</b> Hot-air soldering technique prevents overheating of electrical components GSFC-91	B63-10536	01
Temperature-sensitive network drives astable multivibrator GSFC-137	B63-10609	01	Ring counter may be advanced or retarded by command signal GSFC-101	B64-10144	01
Efficient circuit triggers high-current, high-voltage pulses MSC-14	B64-10024	01	<b>RIVET</b> Jig and fixture aid fabrication of tungsten rivets LEWIS-185	B65-10101	05
Field effect transistors used as voltage-controlled resistors M-FS-174	B64-10163	01	<b>RLC CIRCUIT</b> Voltage variable oscillator has high phase stability LANGLEY-123	B65-10204	01
Microparticle impact sensor measures energy directly GSFC-252	B65-10048	01	<b>ROCK</b> Rock bit requires no flushing medium to maintain drilling speed JPL-WOO-031	B65-10109	05
Electropneumatic rheostat regulates high current ARC-44	B65-10299	01	<b>ROCKET</b> Novel clamps align large rocket cases, eliminate back-up bars M-FS-1	B63-10376	05
Thin-film resistors used in functional electronic blocks GSFC-380	B65-10305	01	<b>ROCKET CHAMBER</b> New method used to fabricate light-weight heat exchanger for rocket motor LEWIS-43	B63-10346	02
<b>RESOLUTION</b> Modified developer increases line resolution in photosensitive resist GSFC-386	B65-10278	01	<b>ROCKET EXHAUST</b> Air-cured ceramic coating insulates against high heat fluxes M-FS-150	B65-10357	03
<b>RESONANT FREQUENCY</b> Welded pressure transducer made as small as 1/8th-inch in diameter ARC-11	B63-10429	03	<b>ROCKET MOTOR CASE</b> New method used to fabricate light-weight heat exchanger for rocket motor LEWIS-43	B63-10346	02
<b>RESPIRATION</b> Device induces lungs to maintain known constant pressure MSC-50	B64-10108	04	Novel clamps align large rocket cases, eliminate back-up bars M-FS-1	B63-10376	05
<b>RESPIRATORY RATE</b> Pneumotachometer counts respiration rate of human subject MSC-92	B64-10259	01	<b>ROD</b> Cooling method prolongs life of hot-wire transducer LEWIS-41	B63-10344	02
<b>RESTRAINT</b> A technique for making animal restraints ARC-25	B63-10564	05	Threading hook facilitates safe recovery of heavy loads MSC-46	B64-10185	05
Safety restrainer prevents whipping of ruptured high-pressure hose LEWIS-99	B64-10348	05	<b>ROLL FORMING</b> Metal bellows custom-fabricated from tubing LEWIS-192	B65-10150	05
Lightweight hinged bellows restraint has high load capacity WOO-151	B65-10341	03	<b>ROLLER BEARING</b> Apparatus of small size can be extended into long, rigid boom JPL-305	B63-10200	05
Universal bellows joint restraint permits angular and offset movement WOO-102	B65-10371	05	Control of component differential hardness increases bearing life LEWIS-190	B65-10251	05
<b>RETAINER</b> New package for Belleville spring permits rate change, easy disassembly JPL-392	B63-10247	05	<b>ROLLING</b> Apparatus of small size can be extended into long, rigid boom JPL-305	B63-10200	05
Simple mechanism combines positive locking and quick-release features WOO-4	B63-10420	05	<b>ROTARY DRIVE</b> Device transmits rotary motion through hermetically sealed wall JPL-303	B63-10198	05
<b>REVERSER</b> Novel clamps align large rocket cases, eliminate back-up bars M-FS-1	B63-10376	05	Fine-particle filter prevents damage to vacuum pumps LEWIS-106	B63-10489	05
<b>RHENIUM COMPOUND</b> Tungsten wire and tubing joined by nickel brazing M-FS-394	B65-10391	05			

SUBJECT INDEX

**ROTATING BODY**  
 Dispensing system eliminates torsion in  
 deployed hoses  
 MSC-80 B65-10185 05

**ROTATING MACHINE**  
 Shock absorber protects motive components  
 against overloads  
 WOO-092 B65-10008 05

Pickup device reads pressures from ports in  
 rotating mechanisms  
 LEWIS-158 B65-10021 05

Rotating holder permits accurate grinding of  
 metallurgical microsamples  
 LEWIS-131 B65-10262 05

**ROTATING SHAFT**  
 Apparatus alters position of objects to  
 facilitate demagnetization  
 GSFC-234 B64-10277 05

Flexible plastic ring assembly makes durable  
 shaft seal  
 WOO-227 B65-10367 05

**ROTATION**  
 Bearing transmits rotary and axial motion  
 LANGLEY-27 B64-10130 05

**ROTOR**  
 Rotor position sensor switches currents in  
 brushless Dc motors  
 GSFC-315 B65-10151 01

Brushless DC motor uses electron beam  
 switching tube as commutator  
 GSFC-345 B65-10237 01

**RUBBER**  
 Frictional wedge shock mount is inexpensive,  
 has good damping characteristics  
 JPL-IT-1001 B63-10289 05

**RUBIDIUM**  
 Magnetometer measures orthogonal components  
 of magnetic fields  
 GSFC-395 B65-10315 01

**RUPTURE**  
 Safety restrainer prevents whipping of  
 ruptured high-pressure hose  
 LEWIS-99 B64-10348 05

Universal bellows joint restraint permits  
 angular and offset movement  
 WOO-102 B65-10371 05

**S**

**SAFETY DEVICE**  
 Self-balancing beam permits safe, easy load  
 handling under overhang  
 M-FS-84 B63-10571 05

Comfortable, lightweight safety helmet holds  
 radio transmitter, receiver  
 MSC-53 B64-10015 05

Safety restrainer prevents whipping of  
 ruptured high-pressure hose  
 LEWIS-99 B64-10348 05

Fluid check valve has fail-safe feature  
 JPL-0019 B65-10207 05

**SAMPLING DEVICE**  
 Rock bit requires no flushing medium to  
 maintain drilling speed  
 JPL-WOO-031 B65-10109 05

Plastic bags in evacuated chamber make  
 lightweight gas sampling system  
 FRC-31 B65-10264 01

Frequency correction device uses digital  
 circuitry  
 GSFC-268 B65-10307 01

Probe samples components of rocket engine  
 exhaust  
 M-FS-485 B65-10384 03

**SANDWICH CONSTRUCTION**  
 Apparatus permits flexure testing of specimens  
 at cryogenic temperatures  
 M-FS-257 B65-10129 02

Fastener distributes stress evenly from  
 sandwich-panel-hung items  
 MSC-236 B65-10358 05

**SATELLITE COMMUNICATION**  
 Communication system uses modulated laser beam  
 GSFC-377 B65-10333 01

**SCALE**  
 Simple scale interpolator facilitates  
 reading of graphs  
 LANGLEY-88 B65-10070 05

**SCALE MODEL**  
 Built-in templates speed up process for making  
 accurate models  
 LANGLEY-23 B63-10526 05

**SCANNING DEVICE**  
 Multiple port pressure scanner valve features  
 greater accuracy, quicker data  
 JPL-555 B64-10031 05

Distant objects detected visually with  
 optical filters  
 LANGLEY-166 B65-10252 02

**SCINTILLATION COUNTER**  
 Cesium iodide crystals fused to vacuum tube  
 faceplates  
 GSFC-67 B63-10476 03

**SCREEN**  
 Fine-mesh screen made by simplified method  
 WOO-104 B64-10282 03

Screening technique makes reliable bond at  
 room temperature  
 M-FS-227 B65-10004 03

Library of documents compressed into lap-held  
 display kit  
 MSC-125 B65-10030 01

**SEA WATER**  
 Emergency solar still desalts seawater  
 MSC-135 B65-10214 03

**SEALANT**  
 Packless valve with all-metal seal handles  
 wide temperature, pressure range  
 JPL-361 B63-10228 05

Elastomers bonded to metal surfaces seal  
 electrochemical cells  
 GSFC-168 B64-10113 03

**SEALING**  
 Vented piston seal prevents fluid leakage  
 between two chambers  
 JPL-179 B63-10141 05

Device transmits rotary motion through hermet-  
 ically sealed wall  
 JPL-303 B63-10198 05

Packless valve with all-metal seal handles  
 wide temperature, pressure range  
 JPL-361 B63-10228 05

Design of valve permits sealing even if the  
 stem is misaligned  
 LEWIS-38 B63-10341 05

Vacuum-type backup bar speeds weld repairs  
 M-FS-12 B63-10384 05

Tool facilitates sealing of metal fill tubes  
 MSC-24 B63-10519 05

SUBJECT INDEX

Connector seals fluid lines at cryogenic temperatures and high vacuums GSFC-253	B64-10327	05		
Use of tear ring permits repair of sealed module circuitry M-FS-210	B65-10014	05		
Seal allows blind assembly and thermal expansion of components NU-0005	B65-10053	05		
Low-cost seal compensates for surface irregularities NU-0016	B65-10160	05		
Improved poppet valve provides positive damageproof seal M-FS-293	B65-10346	05		
<b>SEAT</b>				
Valve designed with elastic seat JPL-442	B65-10040	05		
<b>SECONDARY EMISSION</b>				
Lightweight coaxial cable connector reduces signal loss JPL-720	B65-10244	01		
<b>SEISMOMETER</b>				
Unmanned seismometer levels self, corrects drift errors GSFC-100	B63-10551	01		
Seismic transducer measures small horizontal displacements M-FS-81	B65-10029	05		
<b>SELENIUM</b>				
Selenium bond decreases On resistance of light-activated switch JPL-SC-101	B65-10324	01		
<b>SELF-SEALING</b>				
Self sealing disconnect for tubing forms metal seal after breakaway JPL-354	B63-10226	05		
<b>SEMICONDUCTOR</b>				
Radiation detector-optical hanging device is of simplified construction GSFC-251	B64-10299	01		
Optical arrangement increases useful light output of semiconductor diodes JPL-SC-064	B65-10020	05		
Impurity diffusion process for silicon semiconductors is fast and precise GSFC-397	B65-10300	01		
<b>SEMICONDUCTOR DEVICE</b>				
Thermocompression bonding produces efficient surface-barrier diode JPL-SC-066	B65-10007	05		
Photoelectric semiconductor switch operates with low level inputs JPL-SC-068	B65-10033	01		
<b>SENSING</b>				
Transistor voltage comparator performs own sensing GSFC-228	B65-10028	01		
Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114	05		
<b>SENSITIVITY</b>				
Ultra-sensitive transducer advances micro-measurement range ARC-26	B64-10004	01		
Noncontacting vibration transducer has constant sensitivity LANGLEY-99	B65-10392	01		
			<b>SENSOR</b>	
			Solar-angle sensor has no moving parts JPL-418	B63-10260 02
			Improved sensor counts micrometeoroid penetrations LEWIS-76	B63-10443 01
			Tiny sensor-transmitter can withstand extreme acceleration, gives digital output ARC-22	B63-10561 01
			Simple circuit continuously monitors thermocouple sensor M-FS-61	B63-10567 01
			Speed-sensing device aids crane operators WS-4	B64-10006 05
			Ohmmeter senses depletion of lubricant in journal bearings LEWIS-37	B64-10042 01
			Apparatus measures very small thrusts W00-048	B64-10284 05
			Explosives actuate nonmagnetic indexing device GSFC-237	B65-10017 05
			Wide-angle sensor measures radiant heat energy in corrosive atmospheres M-FS-228	B65-10019 05
			Microparticle impact sensor measures energy directly GSFC-252	B65-10048 01
			Sensitive level sensor made with spirit level, gives electrical output LANGLEY-49	B65-10067 01
			Photoelectric sensor output controlled by eyeball movements M-FS-274	B65-10079 01
			Transducer senses displacements of panels subjected to vibration ARC-37	B65-10085 01
			Rotor position sensor switches currents in brushless Dc motors GSFC-315	B65-10151 01
			Internal cooling increases range of immersion-type temperature probe LEWIS-171	B65-10157 02
			Pressure sensor responds only to shock wave M-FS-238	B65-10184 01
			Frequency correction device uses digital circuitry GSFC-268	B65-10307 01
			Photosensors used to maintain welding electrode-to-joint alignment MSC-243	B65-10401 05
			<b>SEPARATION</b>	
			Self sealing disconnect for tubing forms metal seal after breakaway JPL-354	B63-10226 05
			Splice plate design assures structural separation by mild explosive MSC-137	B65-10166 05
			Threaded split ring connector separates structural sections LANGLEY-145	B65-10383 05
			<b>SEPARATOR</b>	
			Centrifugal device separates liquid from gas MSC-282	B65-10394 05
			<b>SEQUENTIAL CONTROL</b>	
			Ring counter may be advanced or retarded by command signal GSFC-101	B64-10144 01

SUBJECT INDEX

**SERVOAMPLIFIER**

Apparatus measures very small thrusts  
WOO-048 B64-10284 05

Tension is servo controlled in film advance system  
LANGLEY-54 B65-10075 05

Servo calorimeter measures material heating rate  
NU-0024 B65-10247 01

**SERVOCONTROL**

Crystal measures short-term, large-magnitude forces  
JPL-77 B65-10187 01

**SERVOMECHANISM**

Optics used to measure torque at high rotational speeds  
LEWIS-13 B63-10338 01

Servo system facilitates photoelastic strain measurements on resins  
JPL-504 B64-10280 01

High-gain amplifier has excellent stability and low power consumption  
GSFC-272 B65-10138 01

**SERVOMOTOR**

Hydraulic device provides accurate displacements to microinches  
MSC-112 B65-10230 05

**SHAFT**

Device transmits rotary motion through hermetically sealed wall  
JPL-303 B63-10198 05

Bearing transmits rotary and axial motion  
LANGLEY-27 B64-10130 05

Shock absorber protects motive components against overloads  
WOO-092 B65-10008 05

New coupling compensates for shaft misalignment  
NU-0013 B65-10077 05

**SHEATH**

Metal sheath improves thermocouple using graphite in one leg  
NU-0011 B65-10051 01

**SHEET**

Vacuum forming of thermoplastic sheet results in low-cost investment casting patterns  
ARC-7 B63-10008 05

Machine tests crease durability of sheet materials  
JPL-604 B64-10178 05

**SHEET METAL**

Apparatus of small size can be extended into long, rigid boom  
JPL-305 B63-10200 05

Built-in templates speed up process for making accurate models  
LANGLEY-23 B63-10526 05

Collar positions strip stock used to form coil on mandrel  
JPL-198 B65-10130 05

Metal bellows custom-fabricated from tubing  
LEWIS-192 B65-10150 05

Infrared shield facilitates optical pyrometer measurements  
LANGLEY-133 B65-10272 02

**SHELL**  
A technique for making animal restraints  
ARC-25 B63-10564 05

**SHIELDING**

Small foamed polystyrene shield protects low-frequency microphones from wind noise  
M-FS-123 B63-10579 01

Flexible curtain shields equipment from intense heat fluxes  
M-FS-48 B65-10044 03

Infrared shield facilitates optical pyrometer measurements  
LANGLEY-133 B65-10272 02

Superconductor shields test chamber from ambient magnetic fields  
JPL-627 B65-10297 02

**SHIFT REGISTER**

Ring counter may be advanced or retarded by command signal  
GSFC-101 B64-10144 01

Magnetic-shift-register circuit controls step motor operations  
GSFC-340 B65-10226 01

**SHOCK**

Frictional wedge shock mount is inexpensive, has good damping characteristics  
JPL-IT-1001 B63-10289 05

Adhesive for vacuum environments resists shock and vibration  
MSC-56 B65-10016 03

**SHOCK ABSORBER**

Thermally conductive metal wool-silicone rubber material can be used as shock and vibration damper  
JPL-321 B63-10207 03

Frictional wedge shock mount is inexpensive, has good damping characteristics  
JPL-IT-1001 B63-10289 05

Break-up of metal tube makes one-time shock absorber, bars rebound  
LANGLEY-1A B63-10304 05

Novel shock absorber features varying yield strengths  
MSC-63A B64-10138 03

Shock absorber protects motive components against overloads  
WOO-092 B65-10008 05

Shock mount isolates pressure transducers from vibration  
JPL-631 B65-10113 05

Wire mesh isolator protects sensitive electronic components  
GSFC-347 B65-10216 05

**SHOCK WAVE**

Pressure sensor responds only to shock wave  
M-FS-238 B65-10184 01

**SHUTTER**

Nulling pyrometer uses KERR cell shutter for fast responses  
NU-0010 B65-10050 01

**SIDELobe REDUCTION**

Novel horn antenna reduces side lobes, improves radiation pattern  
JPL-425 B63-10264 01

**SIEVE**

Strainer fits inside flared-tube fittings  
LANGLEY-180 B65-10388 05

**SIGHT LINE**

Mirror device aligns machine surface perpendicular to sight lines  
WOO-5 B63-10421 02

SUBJECT INDEX

<b>SIGNAL</b>			changes in heartbeat rate	MSC-133	B65-10143	01	
Modified filter prevents conduction of micro-wave signals along high-voltage power supply leads	JPL-63	B63-10091	01	Simple circuit reduces transistor switching time	GSFC-314	B65-10234	01
Circuit switches latching relay in response to signals of different polarity	WOO-055	B63-10508	01	Compact SCR trigger circuit for ignitron switch operates efficiently	M-FS-371	B65-10347	01
Computer determines high-frequency phase stability	GSFC-113	B63-10555	01	<b>SILICON JUNCTION</b>			
Ring counter may be advanced or retarded by command signal	GSFC-101	B64-10144	01	Impurity diffusion process for silicon semiconductors is fast and precise	GSFC-397	B65-10300	01
<b>SIGNAL DETECTION</b>				<b>SILICON OXIDE</b>			
Gapped toroid provides infinite resolution of delay-line pickup	GSFC-370	B65-10258	01	Refractory ceramic has wide usage, low fabrication cost	M-FS-67	B63-10481	03
<b>SIGNAL DETECTOR</b>				Lead oxide ceramic makes excellent high-temperature lubricant	LEWIS-144	B64-10116	03
Detector circuit compensates for vidicon beam current variations	GSFC-310	B65-10212	01	<b>SILICON TRANSISTOR</b>			
<b>SIGNAL DISCRIMINATOR</b>				Zener diode is starter for transistor-regulated power supply	NU-0015	B65-10052	01
Frequency discriminator with binary output eliminates tuned circuits	M-FS-376	B65-10349	01	Temperature transducer has high output, is time stable	GSFC-446	B65-10362	01
<b>SIGNAL DISTORTION</b>				<b>SILICONE</b>			
Frequency offset in linear FM/CW transponder eliminates clutter	M-FS-249	B65-10146	01	Lightweight load support serves as vibration damper	JPL-661	B65-10144	05
Detector circuit compensates for vidicon beam current variations	GSFC-310	B65-10212	01	<b>SILICONE RUBBER</b>			
<b>SIGNAL ENCODING</b>				Thermally conductive metal wool-silicone rubber material can be used as shock and vibration damper	JPL-321	B63-10207	03
Optical output enhances flowmeter accuracy	M-FS-482	B65-10395	02	Pressure molding of powdered materials improved by rubber mold insert	WOO-100	B64-10270	03
<b>SIGNAL FADEOUT</b>				Flexible curtain shields equipment from intense heat fluxes	M-FS-48	B65-10044	03
Lightweight coaxial cable connector reduces signal loss	JPL-720	B65-10244	01	Shock mount isolates pressure transducers from vibration	JPL-631	B65-10113	05
<b>SIGNAL NOISE</b>				<b>SILVER</b>			
Variable word length encoder reduces TV bandwidth requirements	LANGLEY-87	B65-10345	01	Improved molybdenum disulfide-silver motor brushes have extended life	M-FS-64	B63-10479	03
<b>SIGNAL TRANSMISSION</b>				Connector for thermocouple leads saves costly wire, makes reliable connectors	LANGLEY-26	B63-10529	01
Modified filter prevents conduction of micro-wave signals along high-voltage power supply leads	JPL-63	B63-10091	01	Improved electrode gives high-quality biological recordings	MSC-17	B64-10025	04
Digital system accurately controls velocity of electromechanical drive	GSFC-287	B65-10096	01	<b>SILVER ALLOY</b>			
Added diodes increase output of balanced mixer circuit	GSFC-354	B65-10276	01	New brazing alloy eliminates metal-stress cracking	WOO-249	B65-10397	03
<b>SILICON</b>				<b>SILVER CHLORIDE</b>			
Computer circuit will fit on single silicon chip	JPL-513	B63-10514	01	Cesium iodide crystals fused to vacuum tube faceplates	GSFC-67	B63-10476	03
Solid-state switching used to speed up capacitive integrator	LANGLEY-104	B65-10159	01	<b>SILVER-ZINC BATTERY</b>			
<b>SILICON COMPOUND</b>				Auxiliary silver electrode eliminates two-step voltage discharge characteristic of silver-zinc cells	GSFC-169	B64-10114	01
Refractory ceramic has wide usage, low fabrication cost	M-FS-67	B63-10481	03	<b>SIMULATOR</b>			
<b>SILICON CONTROL RECTIFIER /SCR/</b>				Electronic device simulates respiration rate and depth			
Circuit controls transients in SCR inverters	GSFC-120	B63-10600	01				
Digital-output cardi tachometer measures rapid							

SUBJECT INDEX

MSC-89	B64-10255	01	<b>SOLAR RADIATION</b>		
Simulator produces physiological waveforms			Simple control device senses solar position		
MSC-94	B65-10091	01	JPL-638	B65-10061	01
<b>SIMULATOR TRAINING</b>			Multiple element soft X-ray source produces		
Technique simulates effect of reduced gravity			wide range of radiation		
LANGLEY-44	B64-10146	04	GSFC-286	B65-10082	02
<b>SINE WAVE</b>			<b>SOLAR SENSOR</b>		
Field effect transistor presents high input impedance in AC amplifier			Solar-angle sensor has no moving parts		
JPL-500	B65-10232	01	JPL-418	B63-10260	02
<b>SINTERING</b>			<b>SOLDER</b>		
Improved molybdenum disulfide-silver motor brushes have extended life			Cesium iodide crystals fused to vacuum tube faceplates		
M-FS-64	B63-10479	03	GSFC-67	B63-10476	03
New sintering process adjusts magnetic value of ferrite cores			Hot-air soldering technique prevents overheating of electrical components		
GSFC-129	B63-10606	01	GSFC-91	B63-10536	01
<b>SKIN</b>			Improved solderless connector is easily disconnected		
Flexible fastener allows thermal expansion			JPL-SC-060	B65-10197	01
LANGLEY-40	B64-10145	05	<b>SOLDERED JOINT</b>		
<b>SKIN /BIOL/</b>			Circuit reliability boosted by soldering pins of disconnect plugs to sockets		
Improved electrode gives high-quality biological recordings			JPL-447	B64-10002	01
MSC-17	B64-10025	04	<b>SOLDERING</b>		
Improved conductive paste secures biomedical electrodes			Hot-air soldering technique prevents overheating of electrical components		
MSC-107	B65-10015	03	GSFC-91	B63-10536	01
<b>SLEEVE</b>			Compact coaxial connector for printed circuit adds reliability		
Self sealing disconnect for tubing forms metal seal after breakaway			MSC-57	B64-10016	01
JPL-354	B63-10226	05	Solder flux leaves corrosion-resistant coating on metal		
Sleeve and cutter simplify disconnecting welded joint in tubing			JPL-611	B64-10206	03
JPL-384	B63-10240	05	Feed-through has polyterminal feature		
New coupling compensates for shaft misalignment			M-FS-25	B65-10057	01
NU-0013	B65-10077	05	High permeability semiconductors permit close-tolerance soldering		
New nut and sleeve improve flared connections			GSFC-319	B65-10134	05
M-FS-194	B65-10180	05	<b>SOLENOID</b>		
Shrinkable sleeve eliminates shielding gap in RF cable			Solenoid permits remote control of stop watch and assures restarting		
W00-207	B65-10387	01	FRC-17	B63-10024	01
<b>SLIP BAND</b>			Electromechanically operated camera shutter provides uniform exposure		
Contact stresses calculated for miniature slip rings			JPL-357	B63-10227	01
M-FS-280	B65-10098	05	Camera shutter is actuated by electric signal		
<b>SLOT</b>			ARC-20	B63-10560	05
V-slotted screw head and matching driving tool facilitate insertion and removal of screw fasteners			Improved magnetometer uses toroidal gating coil		
FRC-16	B63-10023	05	GSFC-249	B65-10103	01
<b>SOAP</b>			Force controlled solenoid drives microweld tester		
Instrument calibrates low gas-rate flowmeters			W00-125	B65-10182	01
MSC-134	B65-10137	01	<b>SOLID LUBRICANT</b>		
<b>SOLAR CELL</b>			Lead oxide ceramic makes excellent high-temperature lubricant		
New method used to fabricate gallium arsenide photovoltaic device			LEWIS-144	B64-10116	03
W00-062	B64-10019	01	<b>SOLID SOLUTION</b>		
<b>SOLAR ENERGY</b>			Brazing method produces solid-solution bond between refractory metals		
Wide-aperture solar energy collector is light in weight			LEWIS-212	B65-10370	05
JPL-SC-055	B65-10046	02	<b>SOLID STATE DEVICE</b>		
Modular thermoelectric cell is easily packaged in various arrays			Digital cardiometer computes and displays heartbeat rate		
GSFC-339	B65-10199	01	MSC-93	B64-10258	01
Emergency solar still desalts seawater			Logarithmic amplifier uses field effect transistors		
MSC-135	B65-10214	03	JPL-509	B65-10145	01

SUBJECT INDEX

Analog-to-digital converter has increased reliability and reduced power consumption GSFC-246	B65-10194	01	NEO-13	B65-10239	02
Thin-film resistors used in functional electronic blocks GSFC-380	B65-10305	01	<b>SPHERE</b> Reference black body is compact, convenient to use ARC-3	B63-10004	03
Threshold detector produces narrow pulses at high repetition rates GSFC-383	B65-10310	01	Modified gas bearing is adjustable to optimum stiffness ratio M-FS-145	B64-10050	05
<b>SOLVENT</b> Method of welding joint in closed vessel improves quality of seam JPL-170	B63-10139	05	Pneumatic power is transmitted through air bearing MSC-8	B64-10141	05
Soluble undercoating facilitates removal of foamed-in-place insulation LEWIS-193	B65-10344	03	<b>SPIN FORGING</b> Stainless-steel elbows formed by spin forging M-FS-122	B63-10590	05
<b>SPACE ENVIRONMENT</b> Unique gear design provides self-lubrication JPL-SC-079	B65-10366	03	<b>SPLINE FUNCTION</b> New coupling compensates for shaft misalignment NU-0013	B65-10077	05
<b>SPACE SYSTEMS ENGINEERING</b> Pressure transducer system is force-balanced, has digital output M-FS-154	B65-10174	05	Indexing device ensures proper mating of electrical connectors MSC-155	B65-10263	01
<b>SPACE VEHICLE CONTROL</b> Plated nickel wire mesh makes superior catalyst bed MSC-216	B65-10321	03	<b>SPOT WELDING</b> Welded pressure transducer made as small as 1/8th-inch in diameter ARC-11	B63-10429	03
<b>SPACECRAFT</b> High purity electroforming yields superior metal models ARC-6	B63-10007	05	Welding procedure improves quality of welds, offers other advantages M-FS-32	B64-10309	01
Kinetic-energy absorber employs frictional force between mating cylinders LEWIS-75	B63-10442	05	<b>SPRAY</b> Quick-hardening problems are eliminated with spray gun modification which mixes resin and accelerator liquids during application LANGLEY-6A	B63-10318	03
Ultra-sensitive transducer advances micro-measurement range ARC-26	B64-10004	01	<b>SPRAYING APPARATUS</b> Inert gas spraying device aids in repair of hazardous systems LEWIS-8B	B65-10115	05
Special coatings control temperature of structures GSFC-444	B65-10337	03	<b>SPRING</b> Solenoid permits remote control of stop watch and assures restarting FRC-17	B63-10024	01
<b>SPACECRAFT COMPONENT</b> Apparatus alters position of objects to facilitate demagnetization GSFC-234	B64-10277	05	New package for Belleville spring permits rate change, easy disassembly JPL-392	B63-10247	05
<b>SPACECRAFT ORBIT</b> Oceanborne transponder platform has good stability M-FS-171	B65-10035	05	Apparatus measures very small thrusts WOD-048	B64-10284	05
<b>SPACECRAFT SENSOR</b> Improved sensor counts micrometeoroid penetrations LEWIS-76	B63-10443	01	Gage measures electrical connector pin retention force JPL-SC-071	B65-10034	03
<b>SPACECRAFT TRACKING</b> Oceanborne transponder platform has good stability M-FS-171	B65-10035	05	Leaf-spring suspension provides accurate parallel displacements JPL-480	B65-10104	05
Frequency offset in linear FM/CW transponder eliminates clutter M-FS-249	B65-10146	01	Collapsible truss structure is automatically expandable GSFC-265	B65-10126	05
<b>SPECTROGRAPH</b> Simple optical system used to align spectrograph LANGLEY-92	B65-10071	02	Coiled spring makes self-locking device for threaded fasteners MSC-149	B65-10135	05
<b>SPECTROGRAPHY</b> System selects framing rate for spectrograph camera LANGLEY-55	B65-10086	01	Lightweight load support serves as vibration damper JPL-661	B65-10144	05
<b>SPECTROMETER</b> Ion pump provides increased vacuum pumping speed			Bidirectional torque filter eliminates backlash GSFC-335	B65-10148	05
			Spiral heater coils hand-formed with fixture LEWIS-208	B65-10192	05
			<b>STABILITY</b> Computer determines high-frequency phase		

SUBJECT INDEX

stability GSFC-113	B63-10555	01	JPL-375	B63-10236	05
Monostable circuit with tunnel diode has fast recovery GSFC-132	B63-10603	01	<b>STEEL STRUCTURE</b> Flexible magnetic planning boards are easily transported M-FS-340	B65-10219	05
Irradiation improves properties of an aromatic polyester LANGLEY-115	B65-10164	03	<b>STEP FUNCTION</b> Stepping switch with simple actuator provides many contacts in small space JPL-122	B63-10118	01
Refractory oxides evaluated for high-temperature use LANGLEY-121	B65-10167	03	<b>STIMULUS</b> Subminiature biotelemetry unit permits remote physiological investigations ARC-39	B64-10171	01
<b>STABILIZER</b> New inflatable liferaft is nontippable MSC-4A	B64-10001	05	<b>STOPWATCH CONTROL</b> Solenoid permits remote control of stop watch and assures restarting FRC-17	B63-10024	01
<b>STAINLESS STEEL</b> Apparatus facilitates high-temperature tensile testing in vacuum LEWIS-42	B63-10345	03	<b>STORAGE</b> Stepping switch with simple actuator provides many contacts in small space JPL-122	B63-10118	01
Ellipsoidal optical reflectors reproduced by electroforming GSFC-92	B63-10547	05	Metal strip forms 21 foot boom, rolls up for compact storage GSFC-151	B64-10011	05
Stainless-steel elbows formed by spin forging M-FS-122	B63-10590	05	<b>STORAGE DEVICE</b> Metal strip forms 21 foot boom, rolls up for compact storage GSFC-151	B64-10011	05
Screening technique makes reliable bond at room temperature M-FS-227	B65-10004	03	<b>STORAGE TANK</b> Helical tube separates nitrogen gas from liquid nitrogen JPL-398	B63-10251	05
New alloy brazes titanium to stainless steel MSC-102	B65-10060	05	<b>STORAGE UNIT</b> Compact cartridge drives coded tape at constant readout speed JPL-472	B64-10222	01
New nut and sleeve improve flared connections M-FS-194	B65-10180	05	<b>STORE</b> Dispensing system eliminates torsion in deployed hoses MSC-80	B65-10185	05
Coating method enables low-temperature brazing of stainless steel NU-0030	B65-10250	03	<b>STRAIN</b> Dispensing system eliminates torsion in deployed hoses MSC-80	B65-10185	05
Plastic plus stainless-steel fibers make resilient, impermeable material WOO-246	B65-10374	03	<b>STRAIN GAUGE</b> Rapid helium-air analyzer can measure other binary gas mixtures LANGLEY-16	B63-10557	03
New brazing alloy eliminates metal-stress cracking WOO-249	B65-10397	03	Forming blocks speed production of strain gage grids LEWIS-182	B65-10009	05
<b>STARTER</b> Zener diode is starter for transistor-regulated power supply NU-0015	B65-10052	01	Differential pressure gauge has fast response M-FS-358	B65-10285	05
Compact SCR trigger circuit for ignitron switch operates efficiently M-FS-371	B65-10347	01	<b>STRESS</b> Radiant heater for vacuum furnaces offers high structural rigidity, low heat loss LEWIS-39	B63-10342	01
<b>STARTING</b> Circuit controls transients in SCR inverters GSFC-120	B63-10600	01	Stringent cleaning technique assures reliable epoxy bond GSFC-161	B64-10142	03
<b>STATIC LOADING</b> Pressure responsive seal handles static and dynamic loads GSFC-441	B65-10327	05	New brazing alloy eliminates metal-stress cracking WOO-249	B65-10397	03
<b>STATIC PRESSURE</b> Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114	05	<b>STRESS AND LOAD</b> Contact stresses calculated for miniature slip rings M-FS-280	B65-10098	05
<b>STATOR</b> Brushless DC motor uses electron beam switching tube as commutator GSFC-345	B65-10237	01	<b>STRESS CORROSION</b> Aluminum alloys protected against stress-corrosion cracking		
<b>STEADY STATE</b> Improved variable-reluctance transducer measures transient pressures LANGLEY-10	B63-10321	01			
<b>STEEL</b> Lightweight universal joint transmits both torque and thrust					

SUBJECT INDEX

M-FS-235	B65-10172	03	Shaped superconductor cylinder retains intense magnetic field	JPL-381	B63-10238	01
<b>STRESS DISTRIBUTION</b>						
Lightweight hinged bellows restraint has high load capacity	W00-151	B65-10341	03	Superconductor shields test chamber from ambient magnetic fields	JPL-627	B65-10297 02
<b>STRESS MEASUREMENT</b>				<b>SUPERCOOLING</b>		
Miniature stress transducer has directional capability	JPL-591	B65-10023	01	Supercold technique duplicates magnetic field in second superconductor	JPL-376	B63-10237 05
<b>STRESS RATIO</b>				<b>SUPERFLUIDITY</b>		
Testing device subjects elastic materials to biaxial deformations	JPL-616	B65-10189	03	Cryogenic filter method produces super-pure helium and helium isotopes	JPL-374	B63-10235 03
<b>STRESS RUPTURE</b>				<b>SUPPORT</b>		
Apparatus facilitates pressure-testing of metal tubing	LEWIS-174	B65-10131	05	Mounting for diodes provides efficient heat sink	M-FS-197	B64-10283 01
<b>STRESSED-SKIN CONSTRUCTION</b>				<b>SUPPORT SYSTEM</b>		
Flexible fastener allows thermal expansion	LANGLEY-40	B64-10145	05	Nonresonant support facilitates vibration testing of structures	M-FS-224	B65-10039 05
<b>STRIP</b>				Flexure support system protects thermally and dynamically loaded models	LANGLEY-39	B65-10042 05
New method used to fabricate light-weight heat exchanger for rocket motor	LEWIS-43	B63-10346	02	Lightweight load support serves as vibration damper	JPL-661	B65-10144 05
Test strips detect different CO2 concentrations in closed compartments	MSC-210	B65-10390	03	<b>SURFACE</b>		
<b>STRUCTURAL STABILITY</b>				Portable flooring protects finished surfaces, is easily moved	M-FS-15	B63-10387 05
New method used to fabricate light-weight heat exchanger for rocket motor	LEWIS-43	B63-10346	02	Kinetic-energy absorber employs frictional force between mating cylinders	LEWIS-75	B63-10442 05
<b>STRUCTURAL VIBRATION</b>				Pressure transducer 3/8-inch in size can be faired into surface	W00-065	B64-10021 05
Viscous-pendulum damper suppresses structural vibrations	LANGLEY-45	B64-10272	05	Stringent cleaning technique assures reliable epoxy bond	GSFC-161	B64-10142 03
Seismic transducer measures small horizontal displacements	M-FS-81	B65-10029	05	Connector seals fluid lines at cryogenic temperatures and high vacuums	GSFC-253	B64-10327 05
<b>STRUCTURE</b>				Averaging probe reduces static-pressure sensing errors	LANGLEY-36	B65-10114 05
Variable-transparency wall regulates temperatures of structures	LANGLEY-25	B63-10528	03	Portable tool cleans pipes and tubing	MSC-238	B65-10375 05
Nonresonant support facilitates vibration testing of structures	M-FS-224	B65-10039	05	<b>SURFACE CHEMISTRY</b>		
Air-cured ceramic coating insulates against high heat fluxes	M-FS-150	B65-10357	03	Instrument performs nondestructive chemical analysis, data can be telemetered	JPL-SC-078	B65-10317 01
<b>SUBSTRATE</b>				<b>SURFACE COATING</b>		
Tantalum cathode improves electron-beam evaporation of tantalum	JPL-W00-021	B65-10175	03	Gate valve with ceramic-coated base operates at high temperatures	ARC-23	B63-10562 03
Thin transparent films formed from powdered glass	GSFC-352	B65-10217	03	<b>SURFACE DISTORTION</b>		
<b>SUBSURFACE</b>				Electromagnetic hammer removes weld distortions from aluminum tanks	M-FS-287	B65-10342 05
Oceanborne transponder platform has good stability	M-FS-171	B65-10035	05	<b>SURFACE FINISH</b>		
<b>SUNLIGHT</b>				Portable flooring protects finished surfaces, is easily moved	M-FS-15	B63-10387 05
Pigmented coating resists thermal shock	JPL-SC-083	B65-10354	03	Device measures curved surface finish on gear teeth	W00-112	B65-10064 05
<b>SUPERCONDUCTING MAGNET</b>				Rotating holder permits accurate grinding of		
Superconductor magnets used for stagger-tuning traveling-wave maser	GSFC-292	B65-10165	01			
<b>SUPERCONDUCTOR</b>						
Supercold technique duplicates magnetic field in second superconductor	JPL-376	B63-10237	05			

SUBJECT INDEX

metallurgical microsamples LEWIS-131	B65-10262	05	lines quickly JPL-410	B63-10258	01
<b>SURFACE ROUGHNESS</b> Rough surface improves stability of air- sounding balloons M-FS-320	B65-10326	05	Solid-state switching used to speed up capacitive integrator LANGLEY-104	B65-10159	01
<b>SURFACE VEHICLE</b> Vehicle walks on varied terrain, can assist handicapped persons WOO-005	B64-10274	05	Simple circuit reduces transistor switching time GSFC-314	B65-10234	01
<b>SURGE</b> High-pressure regulating system prevents pressure surges JPL-231	B63-10170	05	Improved circuit minimizes generation of pseudonoise check bits JPL-698	B65-10275	01
<b>SURGICAL INSTRUMENT</b> Encapsulation process sterilizes and preserves surgical instruments JPL-484	B64-10066	05	Cam-operated limit switch features safe fuse replacement MSC-218	B65-10322	01
<b>SUSPENSION</b> Device enables measurement of moments of inertia about three axes GSFC-49	B65-10176	05	<b>SWITCHING ELEMENT</b> DC to AC converter operates efficiency at low input voltages GSFC-130	B65-10178	01
Vacuum chamber provides improved insulation and support for cryostat M-FS-415	B65-10368	02	<b>SWITCHING FUNCTION</b> Knob linkage permits one-hand control of several operations MSC-30	B65-10022	05
<b>SUSPENSION SYSTEM</b> Leaf-spring suspension provides accurate parallel displacements JPL-480	B65-10104	05	<b>SYMMETRY</b> Modified interelement spacing improves Yagi antenna array LANGLEY-130	B65-10183	01
<b>SWITCH</b> Stepping switch with simple actuator provides many contacts in small space JPL-122	B63-10118	01	<b>SYNCHRONOUS DETECTOR</b> Phase detector circuit synthesizes own reference signal M-FS-247	B65-10080	01
Coincident switch closing reduces error in motor-driven timer JPL-182	B63-10143	05	<b>T</b>		
Liquid switch is remotely operated by low DC voltage GSFC-119	B63-10599	01	<b>TAKEOFF AND LANDING</b> New anemometer has fast response, measures dynamic pressure directly LANGLEY-28	B63-10530	05
Digital logic elements provide additional functions from analog input MSC-64	B64-10064	01	<b>TANK</b> Two-part valve acts as quick coupling JPL-478	B64-10223	05
Bandwidth switching is transient-free, avoids loss of loop lock WOO-054	B64-10349	01	Magnets position X-ray film for weld inspection M-FS-253	B65-10110	05
Photoelectric semiconductor switch operates with low level inputs JPL-SC-068	B65-10033	01	Oscillator circuit measures liquid level in tanks M-FS-245	B65-10209	01
Automatic thermal switch accelerates cooling-down of cryogenic system JPL-655	B65-10068	01	Weld leaks rapidly and safely detected M-FS-362	B65-10265	01
Rotor position sensor switches currents in brushless Dc motors GSFC-315	B65-10151	01	<b>TANTALUM</b> Apparatus facilitates high-temperature tensile testing in vacuum LEWIS-42	B63-10345	03
Inflatable bladder provides accurate calibration of pressure switch M-FS-367	B65-10279	01	Tantalum cathode improves electron-beam evaporation of tantalum JPL-WOO-021	B65-10175	03
Selenium bond decreases On resistance of light-activated switch JPL-SC-101	B65-10324	01	Thermoelectric elements diffusion-bonded to tungsten electrodes GSFC-346	B65-10309	01
Three-position rocker switch actuator has positive centering MSC-261	B65-10376	01	<b>TAPERED COLUMN</b> Tool facilitates sealing of metal fill tubes MSC-24	B63-10519	05
<b>SWITCHING</b> Zener diode controls switching of large direct currents MSC-188	B65-10350	01	<b>TELEMETER</b> Device measures fluid drag on test vehicles LANGLEY-34	B65-10195	01
<b>SWITCHING CIRCUIT</b> Double-throw microwave device switches two			<b>TELEMETRY</b> Circuit converts AM signals to FM for magnetic recording GSFC-227	B65-10001	01
			Simple circuit functions as frequency discriminator for PFM signals		

SUBJECT INDEX

GSFC-267	B65-10102	01	Simple circuit provides adjustable voltage with linear temperature variation	JPL-W00-029	B63-10537	01
Variable frequency transistor inverters use multiple core transformers						
GSFC-183	B65-10119	01	Simple transducer measures low heat-transfer rates	JPL-466	B64-10122	01
Circuit reduces distortion of FM modulator						
GSFC-257	B65-10152	01	Seal allows blind assembly and thermal expansion of components	NU-0005	B65-10053	05
Instrument performs nondestructive chemical analysis, data can be telemetered						
JPL-SC-078	B65-10317	01				
<b>TELESCOPE</b>						
Attachment converts microscope to point source autocollimator						
JPL-499	B64-10124	05				
<b>TELEVISION CAMERA</b>						
Raster linearity of video cameras calibrated with precision tester						
GSFC-200	B64-10209	01				
<b>TELEVISION EQUIPMENT</b>						
Unijunction frequency divider is free of backward loading						
JPL-W00-010	B65-10112	01				
<b>TELEVISION TRANSMISSION</b>						
Variable word length encoder reduces TV bandwidth requirements						
LANGLEY-87	B65-10345	01				
<b>TELLURIUM COMPOUND</b>						
IR-transmission glasses formed from oxides of bismuth and tellurium						
M-FS-279	B65-10190	03				
<b>TEMPERATURE</b>						
Two-stage emitter follower is temperature stabilized						
MSC-20	B63-10493	01				
<b>TEMPERATURE COMPENSATION</b>						
New low-level A-C amplifier provides adjustable noise cancellation and automatic temperature compensation						
ARC-2	B63-10003	04				
Simple circuit provides adjustable voltage with linear temperature variation						
JPL-W00-029	B63-10537	01				
<b>TEMPERATURE CONTROL</b>						
Variable-transparency wall regulates temperatures of structures						
LANGLEY-25	B63-10528	03				
Simple control device senses solar position						
JPL-638	B65-10061	01				
Closed fluid system without moving parts controls temperature						
LEWIS-222	B65-10331	02				
Special coatings control temperature of structures						
GSFC-444	B65-10337	03				
<b>TEMPERATURE DIFFERENCE</b>						
Temperature-compensation circuit stabilizes performance of vidicons						
JPL-486	B64-10226	01				
Feed-through connector withstands high temperatures in vacuum environment						
GSFC-442	B65-10328	01				
<b>TEMPERATURE EFFECT</b>						
Hot-air soldering technique prevents overheating of electrical components						
GSFC-91	B63-10536	01				
<b>TEMPERATURE GRADIENT</b>						
Peckless valve with all-metal seal handles wide temperature, pressure range						
JPL-361	B63-10228	05				
			<b>TEMPERATURE MEASUREMENT</b>			
			Thermistor connector assembly increases accuracy of measurements	LANGLEY-62	B65-10045	01
			Infrared shield facilitates optical pyrometer measurements	LANGLEY-133	B65-10272	02
			<b>TEMPERATURE PROBE</b>			
			Internal cooling increases range of immersion-type temperature probe	LEWIS-171	B65-10157	02
			<b>TEMPERATURE PROFILE</b>			
			Density trace made with computer printout	GSFC-322	B65-10200	01
			<b>TEMPERATURE TRANSDUCER</b>			
			Transducer measures temperature differentials in presence of strong electromagnetic fields	ARC-27	B65-10089	01
			Temperature transducer has high output, is time stable	GSFC-446	B65-10362	01
			<b>TEMPLATE</b>			
			Lathe converted for grinding aspheric surfaces	GSFC-115	B63-10556	05
			<b>TENSILE TESTING MACHINE</b>			
			Apparatus facilitates high-temperature tensile testing in vacuum	LEWIS-42	B63-10345	03
			Peel resistance of adhesive bonds accurately measured	GSFC-320	B65-10173	03
			Testing device subjects elastic materials to biaxial deformations	JPL-616	B65-10189	03
			<b>TENSION</b>			
			Buckle joins web straps quickly, adjusts easily	LANGLEY-21	B64-10119	05
			Cantilever springs maintain tension in thermally expanded wires	LEWIS-136	B65-10149	05
			<b>TERMINAL</b>			
			Feed-through has polyterminal feature	M-FS-25	B65-10057	01
			Standoff tool speeds placement of friction-fit electrical terminals	W00-029	B65-10348	05
			Adhesive-backed terminal board eliminates mounting screws	MSC-173	B65-10396	01
			<b>TEST CHAMBER</b>			
			Test device prevents molecular bounce-back	GSFC-82	B63-10546	03
			Multiple test chamber exposes materials to various environments	MSC-179	B65-10268	01
			Superconductor shields test chamber from ambient magnetic fields	JPL-627	B65-10297	02

SUBJECT INDEX

**TEST EQUIPMENT**

Test device prevents molecular bounce-back  
 GSFC-82 B63-10546 03

Machine tests crease durability of sheet  
 materials  
 JPL-604 B64-10178 05

Circuit converts AM signals to FM for  
 magnetic recording  
 GSFC-227 B65-10001 01

Fluid pressure used to test turbopump bearings  
 NU-0001 B65-10024 03

Circuit detects errors in address currents for  
 magnetic core arrays  
 M-FS-234 B65-10047 01

Piezoresistive gage tests pin-connector  
 sockets  
 JPL-675 B65-10128 01

Force controlled solenoid drives microweld  
 tester  
 WOOD-125 B65-10182 01

Testing device subjects elastic materials to  
 biaxial deformations  
 JPL-616 B65-10189 03

Novel probe simplifies electronic component  
 testing  
 GSFC-342 B65-10243 01

**TEST METHOD**

Continuity tester screens out faulty socket  
 connections  
 JPL-596 B64-10065 01

Improved insertion-loss tester  
 JPL-358 B64-10080 01

Electronic device simulates respiration rate  
 and depth  
 MSC-89 B64-10255 01

Apparatus facilitates pressure-testing of  
 metal tubing  
 LEWIS-174 B65-10131 05

Weld leaks rapidly and safely detected  
 M-FS-362 B65-10265 01

Test strips detect different CO2  
 concentrations in closed compartments  
 MSC-210 B65-10390 03

**THERMAL CONDUCTOR**

Cooling method prolongs life of hot-wire  
 transducer  
 LEWIS-41 B63-10344 02

Simple transducer measures low heat-transfer  
 rates  
 JPL-466 B64-10122 01

**THERMAL EFFECT**

Magnetic field test coils are temperature  
 compensated  
 GSFC-294 B65-10081 02

Light ray modulation controls optical system  
 alignment  
 GSFC-171 B65-10211 02

**THERMAL EXPANSION**

Flexible fastener allows thermal expansion  
 LANGLEY-40 B64-10145 05

Fastener provides cooling and compensates for  
 thermal expansion  
 NU-0003 B65-10038 05

Flexure support system protects thermally and  
 dynamically loaded models  
 LANGLEY-39 B65-10042 05

Seal allows blind assembly and thermal expan-

sion of components  
 NU-0005 B65-10053 05

Cantilever springs maintain tension in  
 thermally expanded wires  
 LEWIS-136 B65-10149 05

**THERMAL INSULATION**

Variable-transparency wall regulates tempera-  
 tures of structures  
 LANGLEY-25 B63-10528 03

**THERMAL PROPERTY**

Indium foil with beryllia washer improves  
 transistor heat dissipation  
 GSFC-42 B63-10033 01

**THERMAL PROTECTION**

Flexible curtain shields equipment from  
 intense heat fluxes  
 M-FS-48 B65-10044 03

**THERMAL RADIATION**

Variable-transparency wall regulates tempera-  
 tures of structures  
 LANGLEY-25 B63-10528 03

Refractory metal shielding /insulation/  
 increases operating range of induction furnace  
 LEWIS-202 B65-10188 02

**THERMAL SHOCK**

Refractory ceramic has wide usage, low  
 fabrication cost  
 M-FS-67 B63-10481 03

Pigmented coating resists thermal shock  
 JPL-SC-083 B65-10354 03

**THERMAL STRESS**

Flexible fastener allows thermal expansion  
 LANGLEY-40 B64-10145 05

**THERMISTOR**

Temperature-compensation circuit stabilizes  
 performance of vidicons  
 JPL-486 B64-10226 01

Electronic device simulates respiration rate  
 and depth  
 MSC-89 B64-10255 01

PTC thermistor protects multiloaded power  
 supplies  
 GSFC-236 B64-10281 01

Thermistor connector assembly increases  
 accuracy of measurements  
 LANGLEY-62 B65-10045 01

Wedge immersed thermistor bolometer measures  
 infrared radiation  
 GSFC-443 B65-10330 02

**THERMOCOUPLE**

Connector for thermocouple leads saves costly  
 wire, makes reliable connectors  
 LANGLEY-26 B63-10529 01

Simple circuit continuously monitors  
 thermocouple sensor  
 M-FS-61 B63-10567 01

Wide-angle sensor measures radiant heat energy  
 in corrosive atmospheres  
 M-FS-228 B65-10019 05

Metal sheath improves thermocouple using  
 graphite in one leg  
 NU-0011 B65-10051 01

Transducer measures temperature differentials  
 in presence of strong electromagnetic fields  
 ARC-27 B65-10089 01

Thermocouple-to-instrumentation connector  
 features quick assembly  
 NU-0022 B65-10246 05

SUBJECT INDEX

Hollow plastic hoops protect thermocouple in storage and handling NU-0023	B65-10256	05	catalyst bed MSC-216	B65-10321	03
<b>THERMODYNAMIC PROPERTY</b>			<b>TIME DELAY</b>		
Closed fluid system without moving parts controls temperature LEWIS-222	B65-10331	02	Simple circuit functions as frequency discriminator for PFM signals GSFC-267	B65-10102	01
<b>THERMOELECTRIC CONVERSION SYSTEM</b>			<b>TIME FACTOR</b>		
Modular thermoelectric cell is easily packaged in various arrays GSFC-339	B65-10199	01	Computer modification reduces time of performing iterative division M-FS-166	B65-10005	01
<b>THERMOELECTRIC MATERIAL</b>			Temperature transducer has high output, is time stable GSFC-446	B65-10362	01
Thermoelectric elements diffusion-bonded to tungsten electrodes GSFC-346	B65-10309	01	Binary counter accumulates time by complementary preset MSC-242	B65-10399	01
<b>THERMOMETRY</b>			<b>TIMING APPARATUS</b>		
Apparatus measures concentration of suspended droplets in gas streams LANGLEY-31	B64-10237	01	Coincident switch closing reduces error in motor-driven timer JPL-182	B63-10143	05
<b>THERMOPLASTIC</b>			Unijunction frequency divider is free of backward loading JPL-W00-010	B65-10112	01
Vacuum forming of thermoplastic sheet results in low-cost investment casting patterns ARC-7	B63-10008	05	<b>TIN</b>		
<b>THERMOPLASTIC FILM</b>			Nickel/tin coating protects threaded fasteners in corrosive environment MSC-253	B65-10398	03
Vacuum forming of thermoplastic sheet results in low-cost investment casting patterns ARC-7	B63-10008	05	<b>TIN TELLURIDE</b>		
<b>THIN FILM</b>			Thermoelectric elements diffusion-bonded to tungsten electrodes GSFC-346	B65-10309	01
Efficient thin film heating element takes minimum space GSFC-289	B65-10123	01	<b>TITANIUM</b>		
High permeability semiconductors permit close-tolerance soldering GSFC-319	B65-10134	05	New alloy brazes titanium to stainless steel MSC-102	B65-10060	05
Modified developer increases line resolution in photosensitive resist GSFC-386	B65-10278	01	Titanium treatment improves brazed joints MSC-127	B65-10153	05
Improved wire memory matrix uses very little power JPL-SC-167	B65-10359	01	Titanium diaphragm makes excellent amplitron cathode support GSFC-394	B65-10298	01
<b>THORIUM OXIDE</b>			<b>TITANIUM ALLOY</b>		
Thoriated nickel bonded by solid-state diffusion method LANGLEY-116	B65-10220	03	Galvanic corrosion reduced in aluminum fabrications M-FS-272	B65-10140	03
<b>THRESHOLD</b>			<b>TONOMETRY</b>		
New sintering process adjusts magnetic value of ferrite cores GSFC-129	B63-10606	01	Direct force-measuring transducer used in blood pressure research ARC-53	B65-10325	01
Blocking oscillator uses low triggering voltage MSC-58	B64-10017	01	<b>TOOL</b>		
<b>THRESHOLD DETECTOR</b>			V-slotted screw head and matching driving tool facilitate insertion and removal of screw fasteners FRC-16	B63-10023	05
Circuit maintains digital decision threshold at preset level M-FS-331	B65-10281	01	Special pliers connect hose containing liquid under pressure JPL-IT-1003	B63-10291	05
Constant-current regulator improves tunnel diode threshold-detector performance GSFC-239	B65-10282	01	Heavy-duty staple remover operated by hand JPL-IT-1004	B63-10292	05
Threshold detector produces narrow pulses at high repetition rates GSFC-383	B65-10310	01	Miniature oxygen-hydrogen cutting torch constructed from hypodermic needle JPL-545	B63-10517	05
<b>THRUST</b>			Tool facilitates sealing of metal fill tubes MSC-24	B63-10519	05
Lightweight universal joint transmits both torque and thrust JPL-375	B63-10236	05	Forming blocks speed production of strain gage grids LEWIS-182	B65-10009	05
<b>THRUST MEASUREMENT</b>			Spring loaded beaded cable makes efficient wire puller W00-108	B65-10031	05
Apparatus measures very small thrusts W00-048	B64-10284	05			
<b>THRUSTOR</b>					
Plated nickel wire mesh makes superior					

SUBJECT INDEX

Screw locking cups quickly and neatly crimped NU-0009	B65-10049	05	Device enables measurement of moments of inertia about three axes GSFC-49	B65-10176	05
Cutter and stripper reduces coaxial cable connection time ARC-40	B65-10094	05	Air brake-dynamometer accurately measures torque LEWIS-163	B65-10312	05
Low-cost tool minimizes damage to O-rings during installation MSC-140	B65-10116	05	Miniature servo accelerometer is force-balanced JPL-155	B65-10340	01
Lathe attachment used to machine elliptical cones MSC-100	B65-10168	05	<b>TORQUE MOTOR</b> Hydraulic drive system prevents backlash JPL-371	B65-10351	05
Spiral heater coils hand-formed with fixture LEWIS-208	B65-10192	05	<b>TORSION</b> Dispensing system eliminates torsion in deployed hoses MSC-80	B65-10185	05
Self-aligning fixture used in lathe chuck jaw refacing FRC-21	B65-10198	05	<b>TRAILER</b> Compressed gas system operates semitrailer brakes during winching operation JPL-0036	B64-10306	05
Handtool facilitates extraction of circuit modules LANGLEY-38	B65-10231	05	<b>TRANSDUCER</b> Improved variable-reluctance transducer measures transient pressures LANGLEY-10	B63-10321	01
Standoff tool speeds placement of friction-fit electrical terminals WOO-029	B65-10348	05	Cooling method prolongs life of hot-wire transducer LEWIS-41	B63-10344	02
Portable tool removes burrs from pipe and tubing MSC-237	B65-10360	05	Device calibrates vibration transducers at amplitudes up to 20 G. M-FS-86	B63-10572	01
Portable tool cleans pipes and tubing MSC-238	B65-10375	05	Ultra-sensitive transducer advances micro-measurement range ARC-26	B64-10004	01
Drill bit design assures clean holes in laminated materials WOO-098	B65-10386	05	Simple transducer measures low heat-transfer rates JPL-466	B64-10122	01
<b>TOOLING</b> Insulated weld tooling permits uniform, high-quality weld MSC-42	B64-10058	05	Miniature stress transducer has directional capability JPL-591	B65-10023	01
Fiberglass dies speed forming of large metal sheets M-FS-214	B65-10210	05	Seismic transducer measures small horizontal displacements M-FS-81	B65-10029	05
<b>TORCH</b> Miniature oxygen-hydrogen cutting torch constructed from hypodermic needle JPL-545	B63-10517	05	Vibrating-membrane electrometer has high conversion gain ARC-38	B65-10056	01
<b>TOROID</b> Improved magnetometer uses toroidal gating coil GSFC-249	B65-10103	01	Noncontacting vibration transducer has constant sensitivity LANGLEY-99	B65-10392	01
Gapped toroid provides infinite resolution of delay-line pickup GSFC-370	B65-10258	01	<b>TRANSFER VEHICLE</b> Dispensing system eliminates torsion in deployed hoses MSC-80	B65-10185	05
<b>TORQUE</b> Device transmits rotary motion through hermetically sealed wall JPL-303	B63-10198	05	<b>TRANSFORMER</b> Improved insertion-loss tester JPL-358	B64-10080	01
Lightweight universal joint transmits both torque and thrust JPL-375	B63-10236	05	Variable frequency transistor inverters use multiple core transformers GSFC-183	B65-10119	01
Shock absorber protects motive components against overloads WOO-092	B65-10008	05	<b>TRANSIENT LOAD</b> Circuit controls transients in SCR inverters GSFC-120	B63-10600	01
Slit feeds reduce unbalanced torques in gas-lubricated bearings JPL-264	B65-10099	05	<b>TRANSIENT PRESSURE</b> Improved variable-reluctance transducer measures transient pressures LANGLEY-10	B63-10321	01
Bidirectional torque filter eliminates backlash GSFC-335	B65-10148	05	Burst diaphragm protects vacuum vessel from internal pressure transients		
<b>TORQUE MEASURING APPARATUS</b> Optics used to measure torque at high rotational speeds LEWIS-13	B63-10338	01			

SUBJECT INDEX

JPL-687	B65-10236	05	Highly efficient square-wave oscillator operator at high power levels	GSFC-112	B63-10554	01	
<b>TRANSISTOR</b>							
Indium foil with beryllia washer improves transistor heat dissipation	GSFC-42	B63-10033	01	Low-power transistorized circuit provides staircase waveform	GSFC-48	B64-10007	01
Two-stage emitter follower is temperature stabilized	MSC-20	B63-10493	01	Inexpensive, stable circuit measures heart rate	MSC-95	B65-10010	01
Transistorized trigger circuit is frequency-controllable	GSFC-111	B63-10553	01	Transistor voltage comparator performs own sensing	GSFC-228	B65-10028	01
Highly efficient square-wave oscillator operator at high power levels	GSFC-112	B63-10554	01	Pulse height analyzer operates at high repetition rates, low power	W00-046	B65-10041	01
Low-power transistorized circuit provides staircase waveform	GSFC-48	B64-10007	01	Variable voltage supply uses zener diode as reference	GSFC-262	B65-10097	01
Temperature-compensation circuit stabilizes performance of vidicons	JPL-486	B64-10226	01	Transistorized circuit clamps voltage with 0.1 percent error	GSFC-196	B65-10118	01
Transistorized converter provides nondissipative regulation	GSFC-238	B64-10305	01	Sensitive electrometer features digital output	GSFC-288	B65-10206	01
Pulse generator permits nondestructive testing of component breakdown voltage	MSC-122	B65-10054	01	High-speed square-wave current limiter operates efficiently	JPL-SC-073	B65-10233	01
Feedback oscillator functions as low-level pulse stretcher	GSFC-261	B65-10069	01	Simple circuit reduces transistor switching time	GSFC-314	B65-10234	01
Unijunction frequency divider is free of backward loading	JPL-W00-010	B65-10112	01	Increased junction lead inductance ballasts high-frequency transistors	GSFC-387	B65-10259	01
Digital-output cardiometer measures rapid changes in heartbeat rate	MSC-133	B65-10143	01	Hybrid circuit achieves pulse regeneration with low power drain	GSFC-382	B65-10314	01
Constant-current regulator improves tunnel diode threshold-detector performance	GSFC-239	B65-10282	01	High-intensity flashing beacon powered by mercury cells	LANGLEY-80	B65-10361	01
Boron nitride housing cools transistors	W00-079	B65-10289	01				
Insulator-holder protects transistors in dense electronic assemblies	MSC-214	B65-10389	01	<b>TRANSIT TIME</b>			
				Instrument calibrates low gas-rate flowmeters	MSC-134	B65-10137	01
<b>TRANSISTOR AMPLIFIER</b>				<b>TRANSMISSION</b>			
New low-level A-C amplifier provides adjustable noise cancellation and automatic temperature compensation	ARC-2	B63-10003	04	Lightweight universal joint transmits both torque and thrust	JPL-375	B63-10236	05
High-gain amplifier has excellent stability and low power consumption	GSFC-272	B65-10138	01	IR-transmission glasses formed from oxides of bismuth and tellurium	M-FS-279	B65-10190	03
Tiny biomedical amplifier combines high performance, low power drain	ARC-41	B65-10203	01	<b>TRANSMISSION LINE</b>			
Field effect transistor presents high input impedance in AC amplifier	JPL-500	B65-10232	01	Double-throw microwave device switches two lines quickly	JPL-410	B63-10258	.01
				Plastic molds reduce cost of encapsulating electric cable connectors	M-FS-69	B63-10568	05
<b>TRANSISTOR CIRCUIT</b>				High-pass RF coaxial filter rejects DC and low frequency signals	GSFC-73	B64-10173	01
Igniting system for mercury vapor lamps protects transistorized sustaining supply	JPL-421	B63-10262	01	Electrical cable connector-clamp has smooth exterior surface	MSC-154	B65-10201	05
Two-stage emitter follower is temperature stabilized	MSC-20	B63-10493	01	Oscillator circuit measures liquid level in tanks	M-FS-245	B65-10209	01
Transistorized trigger circuit is frequency-controllable	GSFC-111	B63-10553	01	<b>TRANSMITTER</b>			
				Tiny sensor-transmitter can withstand extreme acceleration, gives digital output			

SUBJECT INDEX

ARC-22	B63-10561	01	Connector for vacuum-jacketed lines cuts tubing system cost	LEWIS-66	B63-10367	05	
Subminiature biotelemetry unit permits remote physiological investigations	ARC-39	B64-10171	01	Composite, vacuum-jacketed tubing replaces bellows in cryogenic systems	LEWIS-67	B63-10368	05
Helical coaxial-resonator makes excellent RF filter	GSFC-243	B65-10012	01	Apparatus facilitates pressure-testing of metal tubing	LEWIS-174	B65-10131	05
Solid-state laser transmitter is amplitude modulated	MSC-121	B65-10238	01	Metal bellows custom-fabricated from tubing	LEWIS-192	B65-10150	05
<b>TRANSPARENCY</b>							
Variable-transparency wall regulates temperatures of structures	LANGLEY-25	B63-10528	03	Dispensing system eliminates torsion in deployed hoses	MSC-80	B65-10185	05
<b>TRANSPONDER</b>							
Oceanborne transponder platform has good stability	M-FS-171	B65-10035	05	Angular glass tubing drawn from round tubing	HQ-20	B65-10235	05
Frequency offset in linear FM/CW transponder eliminates clutter	M-FS-249	B65-10146	01	Portable tool removes burrs from pipe and tubing	MSC-237	B65-10360	05
<b>TRAVELING WAVE MASER</b>							
Superconductor magnets used for stagger-tuning traveling-wave maser	GSFC-292	B65-10165	01	Tungsten wire and tubing joined by nickel brazing	M-FS-394	B65-10391	05
<b>TRAVELING WAVE TUBE</b>							
Traveling-wave tube circuit simplifies microwave relay	GSFC-299	B65-10127	01	<b>TUNGSTEN</b>			
Apparatus facilitates high-temperature tensile testing in vacuum							
LEWIS-42							
B63-10345							
03							
<b>TRICHLOROETHANE</b>							
Organic reactants rapidly produce plastic foam	LANGLEY-37	B65-10288	03	Novel clamps align large rocket cases, eliminate back-up bars	M-FS-1	B63-10376	05
<b>TRUSS</b>							
Collapsible truss structure is automatically expandable	GSFC-265	B65-10126	05	Pressure molding of powdered materials improved by rubber mold insert	WOO-100	B64-10270	03
<b>TUBE</b>							
Self sealing disconnect for tubing forms metal seal after breakaway	JPL-354	B63-10226	05	Jig and fixture aid fabrication of tungsten rivets	LEWIS-185	B65-10101	05
Filter for high-pressure gases has easy take-down, assembly	JPL-373	B63-10234	03	Tantalum cathode improves electron-beam evaporation of tantalum	JPL-WOO-021	B65-10175	03
Helical tube separates nitrogen gas from liquid nitrogen	JPL-398	B63-10251	05	Thermoelectric elements diffusion-bonded to tungsten electrodes	GSFC-346	B65-10309	01
Break-up of metal tube makes one-time shock absorber, bars rebound	LANGLEY-1A	B63-10304	05	Tungsten wire and tubing joined by nickel brazing	M-FS-394	B65-10391	05
Tool facilitates sealing of metal fill tubes	MSC-24	B63-10519	05	<b>TUNGSTEN INERT GAS /TIG/ WELDING</b>			
Metal strip forms 21 foot boom, rolls up for compact storage	GSFC-151	B64-10011	05	Refractory metals welded or brazed with tungsten inert gas equipment	LEWIS-219	B65-10319	05
New nut and sleeve improve flared connections	M-FS-194	B65-10180	05	Tungsten wire and tubing joined by nickel brazing	M-FS-394	B65-10391	05
Strainer fits inside flared-tube fittings	LANGLEY-180	B65-10388	05	<b>TUNNEL DIODE</b>			
Monostable circuit with tunnel diode has fast recovery							
GSFC-132							
B63-10603							
01							
<b>TUBING</b>							
Sleeve and cutter simplify disconnecting welded joint in tubing	JPL-384	B63-10240	05	Tunnel-diode circuit features zero-level clipping	GSFC-241	B65-10002	01
Helical tube separates nitrogen gas from liquid nitrogen	JPL-398	B63-10251	05	Simple circuit produces high-speed, fixed duration pulses	GSFC-285	B65-10228	01
Special pliers connect hose containing liquid under pressure	JPL-IT-1003	B63-10291	05	Constant-current regulator improves tunnel diode threshold-detector performance	GSFC-239	B65-10282	01
<b>TURBINE WHEEL</b>							
Ball bearing used in design of rugged flow-meter							
LEWIS-159							
B64-10170							
05							

SUBJECT INDEX

**TURBOPUMP**  
 Fluid pressure used to test turbopump bearings  
 NU-0001 B65-10024 03

**U**

**ULTRAHIGH VACUUM**  
 Precision gage measures ultrahigh vacuum  
 levels  
 GSFC-114 B63-10597 01

Ion pump provides increased vacuum pumping  
 speed  
 NEO-13 B65-10239 02

Baking enables McLeod gauge to measure in  
 ultrahigh vacuum range  
 GSFC-440 B65-10329 01

**ULTRASONIC AGITATION**  
 High purity electroforming yields superior  
 metal models  
 ARC-6 B63-10007 05

**ULTRASONIC MACHINING**  
 High purity electroforming yields superior  
 metal models  
 ARC-6 B63-10007 05

**ULTRAVIOLET LIGHT**  
 Oil-smeared models aid wind tunnel  
 measurements  
 LANGLEY-4 B63-10311 03

**UNDERWATER VEHICLE**  
 Device measures fluid drag on test vehicles  
 LANGLEY-34 B65-10195 01

**UNMANNED SPACECRAFT**  
 Rotor position sensor switches currents in  
 brushless Dc motors  
 GSFC-315 B65-10151 01

**V**

**VACUUM**  
 New cobalt alloys have high-temperature  
 strength and long life in vacuum environments  
 LEWIS-47 B63-10351 03

Connector seals fluid lines at cryogenic  
 temperatures and high vacuums  
 GSFC-253 B64-10327 05

**VACUUM CHAMBER**  
 Cryopumping of hydrogen in vacuum chambers is  
 aided by catalytic oxidation of hydrogen  
 LEWIS-15 B63-10340 05

Apparatus facilitates high-temperature tensile  
 testing in vacuum  
 LEWIS-42 B63-10345 03

Modified rf coaxial connector ends vacuum  
 chamber wiring problem  
 GSFC-150 B64-10010 01

Vapor pressure measured with inflatable  
 plastic bag  
 GSFC-281 B65-10136 03

Heater decomposes oil backstreaming from  
 high-vacuum pumps  
 GSFC-356 B65-10224 02

Electron bombardment improves vacuum chamber  
 efficiency  
 LEWIS-160 B65-10280 02

**VACUUM DEPOSITION**  
 Vacuum forming of thermoplastic sheet results  
 in low-cost investment casting patterns  
 ARC-7 B63-10008 05

Efficient thin film heating element takes  
 minimum space  
 GSFC-289 B65-10123 01

**VACUUM EQUIPMENT**  
 Connector for vacuum-jacketed lines cuts  
 tubing system cost  
 LEWIS-66 B63-10367 05

Spherical electrode eliminates high-voltage  
 breakdown  
 LEWIS-155 B65-10139 01

Heater decomposes oil backstreaming from  
 high-vacuum pumps  
 GSFC-356 B65-10224 02

Burst diaphragm protects vacuum vessel from  
 internal pressure transients  
 JPL-687 B65-10236 05

Feed-through connector withstands high  
 temperatures in vacuum environment  
 GSFC-442 B65-10328 01

**VACUUM FURNACE**  
 Radiant heater for vacuum furnaces offers high  
 structural rigidity, low heat loss  
 LEWIS-39 B63-10342 01

New cobalt alloys have high-temperature  
 strength and long life in vacuum environments  
 LEWIS-47 B63-10351 03

**VACUUM GAUGE**  
 Ionization vacuum gage starts quickly, is  
 unaffected by spurious currents  
 JPL-304 B65-10036 02

Instrument accurately measures extremely low  
 air densities  
 M-FS-193 B65-10221 01

**VACUUM MELTING**  
 Vacuum forming of thermoplastic sheet results  
 in low-cost investment casting patterns  
 ARC-7 B63-10008 05

**VACUUM PUMP**  
 Fine-particle filter prevents damage to vacuum  
 pumps  
 LEWIS-106 B63-10489 05

Ion pump provides increased vacuum pumping  
 speed  
 NEO-13 B65-10239 02

**VACUUM SYSTEM**  
 Instrument accurately measures extremely low  
 air densities  
 M-FS-193 B65-10221 01

**VACUUM TUBE**  
 Composite, vacuum-jacketed tubing replaces  
 bellows in cryogenic systems  
 LEWIS-67 B63-10368 05

Cesium iodide crystals fused to vacuum tube  
 faceplates  
 GSFC-67 B63-10476 03

Emission tester for high-power vacuum tubes  
 JPL-628 B64-10158 01

**VACUUM ULTRAVIOLET**  
 Fresnel zone plate forms images at wavelengths  
 below 1000 angstroms  
 GSFC-231 B65-10171 02

**VALVE**  
 High-pressure regulating system prevents  
 pressure surges  
 JPL-231 B63-10170 05

Packless valve with all-metal seal handles  
 wide temperature, pressure range  
 JPL-361 B63-10228 05

Design of valve permits sealing even if the  
 stem is misaligned  
 LEWIS-38 B63-10341 05

High-temperature, high-pressure spherical

**SUBJECT INDEX**

segment valve provides quick opening ARC-13	B63-10431	05	<b>VIBRATION</b> Adhesive for vacuum environments resists shock and vibration MSC-56	B65-10016	03
Gate valve with ceramic-coated base operates at high temperatures ARC-23	B63-10562	03	Nonresonant support facilitates vibration testing of structures M-FS-224	B65-10039	05
Multiple port pressure scanner valve features greater accuracy, quicker data JPL-555	B64-10031	05	Rack mount device quickly inserts or extracts chassis units MSC-244	B65-10385	05
Blade valve isolates compartment in pipe, opens to allow free flow JPL-585	B64-10188	05	<b>VIBRATION ABSORBER</b> Thermally conductive metal wool-silicone rubber material can be used as shock and vibration damper JPL-321	B63-10207	03
Two-part valve acts as quick coupling JPL-478	B64-10223	05	<b>VIBRATION DAMPER</b> Shock mount isolates pressure transducers from vibration JPL-631	B65-10113	05
Valve designed with elastic seat JPL-442	B65-10040	05	<b>VIBRATION DAMPING</b> Thermally conductive metal wool-silicone rubber material can be used as shock and vibration damper JPL-321	B63-10207	03
Averaging probe reduces static-pressure sensing errors LANGLEY-36	B65-10114	05	Frictional wedge shock mount is inexpensive, has good damping characteristics JPL-IT-1001	B63-10289	05
Pressure responsive seal handles static and dynamic loads GSFC-441	B65-10327	05	Lightweight load support serves as vibration damper JPL-661	B65-10144	05
Improved poppet valve provides positive damageproof seal M-FS-293	B65-10346	05	Oil-damped mercury pool makes precise optical alignment tool GSFC-353	B65-10253	02
Respiratory transfer valve has fail-safe feature ARC-1	B65-10369	01	<b>VIBRATION MEASUREMENT</b> Transducer senses displacements of panels subjected to vibration ARC-37	B65-10085	01
<b>VAPOR DEPOSITION</b> Economical fabrication process produces high-quality junction transistors JPL-SC-065	B64-10330	01	<b>VIBRATION MEASURING APPARATUS</b> Device calibrates vibration transducers at amplitudes up to 20 G. M-FS-86	B63-10572	01
Tantalum cathode improves electron-beam evaporation of tantalum JPL-W00-021	B65-10175	03	Noncontacting vibration transducer has constant sensitivity LANGLEY-99	B65-10392	01
Boron carbide whiskers produced by vapor deposition HQ-24	B65-10261	03	<b>VIBRATION PROTECTION</b> Improved holder protects crystal during high acceleration and impact JPL-463	B65-10037	05
<b>VAPOR PRESSURE</b> Vapor pressure measured with inflatable plastic bag GSFC-281	B65-10136	03	Wire mesh isolator protects sensitive electronic components GSFC-347	B65-10216	05
<b>VARIATION METHOD</b> Transistorized trigger circuit is frequency-controllable GSFC-111	B63-10553	01	<b>VIBRATION TESTING MACHINE</b> System transmits mechanical vibration into hazardous environment NU-0025	B65-10248	05
<b>VEITCH DIAGRAM</b> Veitch diagram plotter simplifies boolean functions JPL-385	B63-10241	05	<b>VIDICON</b> Raster linearity of video cameras calibrated with precision tester GSFC-200	B64-10209	01
<b>VELOCITY</b> Low-cost tape system measures velocity of acceleration GSFC-85	B63-10512	01	Temperature-compensation circuit stabilizes performance of vidicons JPL-486	B64-10226	01
Digital system accurately controls velocity of electromechanical drive GSFC-287	B65-10096	01	Detector circuit compensates for vidicon beam current variations GSFC-310	B65-10212	01
<b>VELOCITY MEASUREMENT</b> Low-cost tape system measures velocity of acceleration GSFC-85	B63-10512	01	<b>VISCOUS DAMPING</b> Viscous-pendulum damper suppresses structural vibrations LANGLEY-45	B64-10272	05
<b>VENT</b> Vented piston seal prevents fluid leakage between two chambers JPL-179	B63-10141	05	Nonresonant support facilitates vibration		
<b>VESSEL</b> Method of welding joint in closed vessel improves quality of seam JPL-170	B63-10139	05			

SUBJECT INDEX

testing of structures M-FS-224	B65-10039	05	Modular thermoelectric cell is easily packaged in various arrays GSFC-339	B65-10199	01
<b>VISUAL DISPLAY</b>			<b>VOLTAGE BREAKDOWN</b>		
Digital cardiometer computes and displays heartbeat rate MSC-93	B64-10258	01	Spherical electrode eliminates high-voltage breakdown LEWIS-155	B65-10139	01
Pneumotachometer counts respiration rate of human subject MSC-92	B64-10259	01	<b>VOLTAGE GENERATOR</b>		
<b>VISUAL OBSERVATION</b>			Pressure sensor responds only to shock wave M-FS-238	B65-10184	01
Use of photographs speeds inspection of printed-circuit boards MSC-72	B64-10118	01	<b>VOLTAGE REGULATOR</b>		
<b>VISUAL PERCEPTION</b>			Field effect transistors used as voltage- controlled resistors M-FS-174	B64-10163	01
Distant objects detected visually with optical filters LANGLEY-166	B65-10252	02	Transistorized converter provides nondissipa- tive regulation GSFC-238	B64-10305	01
<b>VOLATILITY</b>			Inductor flyback characteristic gives voltage regulator fast response GSFC-361	B65-10257	01
New cobalt alloys have high-temperature strength and long life in vacuum environments LEWIS-47	B63-10351	03	Constant-current regulator improves tunnel diode threshold-detector performance GSFC-239	B65-10282	01
<b>VOLT-AMPERE CHARACTERISTICS</b>			<b>VOLTMETER</b>		
Didymium compound improves nickel-cadmium cell GSFC-295	B65-10083	03	Digital-output cardiometer measures rapid changes in heartbeat rate MSC-133	B65-10143	01
<b>VOLTAGE</b>			<b>VOLUME</b>		
Igniting system for mercury vapor lamps pro- jects transistorized sustaining supply JPL-421	B63-10262	01	Volumetric system calibrates meters for large flow rates W00-130	B65-10323	05
Two-stage emitter follower is temperature stabilized MSC-20	B63-10493	01	<b>W</b>		
Simple circuit provides adjustable voltage with linear temperature variation JPL-W00-029	B63-10537	01	<b>WALL</b>		
Transistorized trigger circuit is frequency- controllable GSFC-111	B63-10553	01	Device transmits rotary motion through hermet- ically sealed wall JPL-303	B63-10198	05
Liquid switch is remotely operated by low DC voltage GSFC-119	B63-10599	01	Shaped superconductor cylinder retains intense magnetic field JPL-381	B63-10238	01
Temperature-sensitive network drives astable multivibrator GSFC-137	B63-10609	01	Test device prevents molecular bounce-back GSFC-82	B63-10546	03
Efficient circuit triggers high-current, high- voltage pulses MSC-14	B64-10024	01	<b>WALL TEMPERATURE DISTRIBUTION</b>		
Auxiliary silver electrode eliminates two-step voltage discharge characteristic of silver- zinc cells GSFC-169	B64-10114	01	Variable-transparency wall regulates tempera- tures of structures LANGLEY-25	B63-10528	03
Voltage generator sweeps oscillator frequency linearly with time M-FS-219	B64-10320	01	<b>WASHER</b>		
Bandwidth switching is transient-free, avoids loss of loop lock W00-054	B64-10349	01	New package for belleville spring permits rate change, easy disassembly JPL-392	B63-10247	05
Transistor voltage comparator performs own sensing GSFC-228	B65-10028	01	Composite seal reduces alkaline battery leakage GSFC-337	B65-10271	01
Variable voltage supply uses zener diode as reference GSFC-262	B65-10097	01	<b>WATER PURIFICATION</b>		
Variable load automatically tests dc power supplies GSFC-291	B65-10105	01	Emergency solar still desalts seawater MSC-135	B65-10214	03
Digital-output cardiometer measures rapid changes in heartbeat rate MSC-133	B65-10143	01	<b>WAVE</b>		
			Auxiliary circuit enables automatic monitoring of EKG MSC-106	B65-10142	01
			<b>WAVE ATTENUATION</b>		
			Modified filter prevents conduction of micro- wave signals along high-voltage power supply leads JPL-63	B63-10091	01
			<b>WAVE GENERATION</b>		
			Variable frequency magnetic multivibrator generates stable square-wave output GSFC-AE-21	B65-10124	01



SUBJECT INDEX

Cantilever springs maintain tension in thermally expanded wires LEWIS-136	B65-10149	05	Variable voltage supply uses zener diode as reference GSFC-262	B65-10097	01
Improved solderless connector is easily disconnected JPL-SC-060	B65-10197	01	Zener diode controls switching of large direct currents MSC-188	B65-10350	01
Improved wire memory matrix uses very little power JPL-SC-167	B65-10359	01	<b>ZERO GRAVITY</b> Magnetic fluid readily controlled in zero gravity environment LEWIS-126	B65-10335	03
Vacuum chamber provides improved insulation and support for cryostat M-FS-415	B65-10368	02	<b>ZINC</b> New method used to fabricate gallium arsenide photovoltaic device W00-062	B64-10019	01
Wire bundle formed into grids with minute interstices W00-089	B65-10372	03	Adherent protective coatings plated on magnesium-lithium alloy M-FS-365	B65-10294	03
Tungsten wire and tubing joined by nickel brazing M-FS-394	B65-10391	05	<b>ZINC ALLOY</b> New brazing alloy eliminates metal-stress cracking W00-249	B65-10397	03
<b>WIRE MESH</b> Wire mesh isolator protects sensitive electronic components GSFC-347	B65-10216	05	<b>ZIRCONIUM OXIDE</b> Refractory oxides evaluated for high-temperature use LANGLEY-121	B65-10167	03
Three-dimensional wire-mesh capacitor system measures fluid density W00-194	B65-10379	01			
Strainer fits inside flared-tube fittings LANGLEY-180	B65-10388	05			
<b>WIRE WINDING</b> Fiberglass parts cured during filament winding eliminates oven, saves time M-FS-14	B65-10088	03			
<b>WIRING SYSTEM</b> Modified rf coaxial connector ends vacuum chamber wiring problem GSFC-150	B64-10010	01			
<b>X</b>					
<b>X-RAY</b> Multiple element soft X-ray source produces wide range of radiation GSFC-286	B65-10082	02			
<b>X-RAY DIFFRACTION</b> Spherical model provides visual aid for cubic crystal study LEWIS-108	B65-10065	03			
<b>X-RAY INSPECTION</b> Magnets position X-ray film for weld inspection M-FS-253	B65-10110	05			
<b>XENON LIGHT</b> High-intensity flashing beacon powered by mercury cells LANGLEY-80	B65-10361	01			
<b>Y</b>					
<b>YAGI ANTENNA</b> Modified interelement spacing improves Yagi antenna array LANGLEY-130	B65-10183	01			
<b>Z</b>					
<b>ZENER DIODE</b> Temperature-sensitive network drives astable multivibrator GSFC-137	B63-10609	01			
Zener diode function generator requires no external reference voltage JPL-33	B65-10013	01			
Zener diode is starter for transistor-regulated power supply NU-0015	B65-10052	01			

# ORIGINATOR/TECH BRIEF NUMBER INDEX

Cumulative Index to Tech Briefs

Issue 3

## Originator/Tech Brief Number Index

The left hand column identifies the originator number; to the right of each originator number is the Tech Brief number, e.g., B65-10023, followed by a two-digit number, e.g., 01, which identifies the subject category containing the entire citation.

ARC-1	B65-10369	01
ARC-2	B63-10003	04
ARC-3	B63-10004	03
ARC-5	B63-10006	01
ARC-6	B63-10007	05
ARC-7	B63-10008	05
ARC-8	B63-10009	05
ARC-11	B63-10429	03
ARC-13	B63-10431	05
ARC-17	B63-10435	05
ARC-20	B63-10560	05
ARC-22	B63-10561	01
ARC-23	B63-10562	03
ARC-25	B63-10564	05
ARC-26	B64-10004	01
ARC-27	B65-10089	01
ARC-28	B64-10068	03
ARC-29	B64-10069	05
ARC-34	B65-10208	01
ARC-36	B64-10143	01
ARC-37	B65-10085	01
ARC-38	B65-10056	01
ARC-39	B64-10171	01
ARC-40	B65-10094	05
ARC-41	B65-10203	01
ARC-42	B65-10120	01
ARC-44	B65-10299	01
ARC-46	B65-10277	01
ARC-47	B65-10316	03
ARC-53	B65-10325	01
FRC-16	B63-10023	05
FRC-17	B63-10024	01
FRC-21	B65-10198	05
FRC-28	B65-10301	01
FRC-31	B65-10264	01
GSFC-34A	B65-10011	01
GSFC-36	B63-10027	01
GSFC-42	B63-10033	01
GSFC-48	B64-10007	01
GSFC-49	B65-10176	05
GSFC-59	B64-10121	05
GSFC-67	B63-10476	03
GSFC-73	B64-10173	01
GSFC-80	B63-10511	01
GSFC-82	B63-10546	03
GSFC-85	B63-10512	01

GSFC-91	B63-10536	01
GSFC-92	B63-10547	05
GSFC-93	B63-10596	01
GSFC-100	B63-10551	01
GSFC-101	B64-10144	01
GSFC-111	B63-10553	01
GSFC-112	B63-10554	01
GSFC-113	B63-10555	01
GSFC-114	B63-10597	01
GSFC-115	B63-10556	05
GSFC-119	B63-10599	01
GSFC-120	B63-10600	01
GSFC-129	B63-10606	01
GSFC-130	B65-10178	01
GSFC-132	B63-10603	01
GSFC-137	B63-10609	01
GSFC-143	B64-10028	05
GSFC-150	B64-10010	01
GSFC-151	B64-10011	05
GSFC-161	B64-10142	03
GSFC-168	B64-10113	03
GSFC-169	B64-10114	01
GSFC-171	B65-10211	02
GSFC-183	B65-10119	01
GSFC-187	B64-10150	01
GSFC-188	B64-10151	03
GSFC-190	B64-10200	01
GSFC-196	B65-10118	01
GSFC-198	B65-10026	01
GSFC-200	B64-10209	01
GSFC-203	B65-10308	01
GSFC-206	B64-10211	05
GSFC-227	B65-10001	01
GSFC-228	B65-10028	01
GSFC-231	B65-10171	02
GSFC-234	B64-10277	05
GSFC-236	B64-10281	01
GSFC-237	B65-10017	05
GSFC-238	B64-10305	01
GSFC-239	B65-10282	01
GSFC-240	B65-10076	01
GSFC-241	B65-10002	01
GSFC-243	B65-10012	01
GSFC-246	B65-10194	01
GSFC-249	B65-10103	01
GSFC-251	B64-10299	01
GSFC-252	B65-10048	01
GSFC-253	B64-10327	05
GSFC-257	B65-10152	01
GSFC-261	B65-10069	01
GSFC-262	B65-10097	01
GSFC-265	B65-10126	05
GSFC-267	B65-10102	01
GSFC-268	B65-10307	01
GSFC-272	B65-10138	01
GSFC-274	B65-10072	01
GSFC-280	B65-10087	01
GSFC-281	B65-10136	03
GSFC-284	B65-10162	03
GSFC-285	B65-10228	01
GSFC-286	B65-10082	02
GSFC-287	B65-10096	01
GSFC-288	B65-10206	01
GSFC-289	B65-10123	01
GSFC-291	B65-10105	01
GSFC-292	B65-10165	01
GSFC-293	B65-10158	01
GSFC-294	B65-10081	02
GSFC-295	B65-10083	03
GSFC-299	B65-10127	01
GSFC-306	B65-10093	01
GSFC-308	B65-10334	01
GSFC-310	B65-10212	01
GSFC-314	B65-10234	01

GSFC-315	.....	B65-10151	01	JPL-358	.....	B64-10080	01
GSFC-317	.....	B65-10225	01	JPL-361	.....	B63-10228	05
GSFC-319	.....	B65-10134	05	JPL-362	.....	B63-10229	01
GSFC-320	.....	B65-10173	03	JPL-371	.....	B65-10351	05
GSFC-322	.....	B65-10200	01	JPL-373	.....	B63-10234	03
GSFC-329	.....	B65-10213	01	JPL-374	.....	B63-10235	03
GSFC-335	.....	B65-10148	05	JPL-375	.....	B63-10236	05
GSFC-337	.....	B65-10271	01	JPL-376	.....	B63-10237	05
GSFC-339	.....	B65-10199	01	JPL-381	.....	B63-10238	01
GSFC-340	.....	B65-10226	01	JPL-384	.....	B63-10240	05
GSFC-342	.....	B65-10243	01	JPL-385	.....	B63-10241	05
GSFC-345	.....	B65-10237	01	JPL-392	.....	B63-10247	05
GSFC-346	.....	B65-10309	01	JPL-397	.....	B63-10250	01
GSFC-347	.....	B65-10216	05	JPL-398	.....	B63-10251	05
GSFC-350	.....	B65-10242	01	JPL-406	.....	B63-10255	01
GSFC-351	.....	B65-10284	01	JPL-410	.....	B63-10258	01
GSFC-352	.....	B65-10217	03	JPL-413	.....	B65-10125	01
GSFC-353	.....	B65-10253	02	JPL-418	.....	B63-10260	02
GSFC-354	.....	B65-10276	01	JPL-421	.....	B63-10262	01
GSFC-356	.....	B65-10224	02	JPL-424	.....	B63-10263	03
GSFC-357	.....	B65-10273	01	JPL-425	.....	B63-10264	01
GSFC-360	.....	B65-10287	01	JPL-442	.....	B65-10040	05
GSFC-361	.....	B65-10257	01	JPL-447	.....	B64-10002	01
GSFC-363	.....	B65-10274	01	JPL-463	.....	B65-10037	05
GSFC-366	.....	B65-10156	03	JPL-466	.....	B64-10122	01
GSFC-370	.....	B65-10258	01	JPL-472	.....	B64-10222	01
GSFC-375	.....	B65-10311	01	JPL-478	.....	B64-10223	05
GSFC-377	.....	B65-10333	01	JPL-480	.....	B65-10104	05
GSFC-380	.....	B65-10305	01	JPL-484	.....	B64-10066	05
GSFC-382	.....	B65-10314	01	JPL-486	.....	B64-10226	01
GSFC-383	.....	B65-10310	01	JPL-499	.....	B64-10124	05
GSFC-385	.....	B65-10283	02	JPL-500	.....	B65-10232	01
GSFC-386	.....	B65-10278	01	JPL-504	.....	B64-10280	01
GSFC-387	.....	B65-10259	01	JPL-508	.....	B65-10132	02
GSFC-388	.....	B65-10364	03	JPL-509	.....	B65-10145	01
GSFC-391	.....	B65-10260	01	JPL-510	.....	B65-10223	01
GSFC-394	.....	B65-10298	01	JPL-513	.....	B63-10514	01
GSFC-395	.....	B65-10315	01	JPL-544	.....	B63-10612	03
GSFC-397	.....	B65-10300	01	JPL-545	.....	B63-10517	05
GSFC-398	.....	B65-10343	01	JPL-555	.....	B64-10031	05
GSFC-399	.....	B65-10355	01	JPL-559	.....	B63-10613	01
GSFC-409	.....	B65-10339	05	JPL-584	.....	B64-10084	05
GSFC-424	.....	B65-10373	02	JPL-585	.....	B64-10188	05
GSFC-440	.....	B65-10329	01	JPL-591	.....	B65-10023	01
GSFC-441	.....	B65-10327	05	JPL-596	.....	B64-10065	01
GSFC-442	.....	B65-10328	01	JPL-604	.....	B64-10178	05
GSFC-443	.....	B65-10330	02	JPL-611	.....	B64-10206	03
GSFC-444	.....	B65-10337	03	JPL-616	.....	B65-10189	03
GSFC-446	.....	B65-10362	01	JPL-627	.....	B65-10297	02
GSFC-AE-21	.....	B65-10124	01	JPL-628	.....	B64-10158	01
HQ-1	.....	B65-10313	01	JPL-631	.....	B65-10113	05
HQ-5	.....	B65-10313	01	JPL-638	.....	B65-10061	01
HQ-7	.....	B65-10306	01	JPL-655	.....	B65-10068	01
HQ-12	.....	B65-10286	01	JPL-658	.....	B65-10205	05
HQ-18	.....	B65-10332	04	JPL-661	.....	B65-10144	05
HQ-20	.....	B65-10235	05	JPL-675	.....	B65-10128	01
HQ-24	.....	B65-10261	03	JPL-686	.....	B65-10191	05
JPL-2A	.....	B65-10222	05	JPL-687	.....	B65-10236	05
JPL-0019	.....	B65-10207	05	JPL-694	.....	B65-10291	02
JPL-0021	.....	B63-10280	01	JPL-698	.....	B65-10275	01
JPL-0029	.....	B63-10284	01	JPL-704	.....	B65-10292	02
JPL-33	.....	B65-10013	01	JPL-720	.....	B65-10244	01
JPL-0036	.....	B64-10306	05	JPL-725	.....	B65-10295	02
JPL-63	.....	B63-10091	01	JPL-771	.....	B65-10293	01
JPL-77	.....	B65-10187	01	JPL-IT-1001	.....	B63-10289	05
JPL-82	.....	B65-10055	01	JPL-IT-1003	.....	B63-10291	05
JPL-122	.....	B63-10118	01	JPL-IT-1004	.....	B63-10292	05
JPL-135	.....	B63-10123	05	JPL-SC-055	.....	B65-10046	02
JPL-155	.....	B65-10340	01	JPL-SC-060	.....	B65-10197	01
JPL-170	.....	B63-10139	05	JPL-SC-064	.....	B65-10020	05
JPL-179	.....	B63-10141	05	JPL-SC-065	.....	B64-10330	01
JPL-182	.....	B63-10143	05	JPL-SC-066	.....	B65-10007	05
JPL-198	.....	B65-10130	05	JPL-SC-068	.....	B65-10033	01
JPL-226	.....	B65-10163	05	JPL-SC-069	.....	B65-10025	01
JPL-231	.....	B63-10170	05	JPL-SC-071	.....	B65-10034	03
JPL-236A	.....	B63-10174	01	JPL-SC-072	.....	B65-10066	01
JPL-264	.....	B65-10099	05	JPL-SC-073	.....	B65-10233	01
JPL-288	.....	B63-10193	01	JPL-SC-074	.....	B65-10267	01
JPL-303	.....	B63-10198	05	JPL-SC-078	.....	B65-10317	01
JPL-304	.....	B65-10036	02	JPL-SC-079	.....	B65-10366	03
JPL-305	.....	B63-10200	05	JPL-SC-083	.....	B65-10354	03
JPL-321	.....	B63-10207	03	JPL-SC-101	.....	B65-10324	01
JPL-345	.....	B65-10147	05	JPL-SC-135	.....	B65-10393	05
JPL-354	.....	B63-10226	05	JPL-SC-167	.....	B65-10359	01
JPL-357	.....	B63-10227	01	JPL-W00-008	.....	B63-10424	03

JPL-W00-010	.....	B65-10112	01	LEWIS-158	.....	B65-10021	05
JPL-W00-021	.....	B65-10175	03	LEWIS-159	.....	B64-10170	05
JPL-W00-029	.....	B63-10537	01	LEWIS-160	.....	B65-10280	02
JPL-W00-031	.....	B65-10109	05	LEWIS-163	.....	B65-10312	05
JPL-W00-039	.....	B65-10121	05	LEWIS-170	.....	B65-10154	05
				LEWIS-171	.....	B65-10157	02
LANGLEY-1A	.....	B63-10304	05	LEWIS-174	.....	B65-10131	05
LANGLEY-4	.....	B63-10311	03	LEWIS-178	.....	B65-10255	01
LANGLEY-6A	.....	B63-10318	03	LEWIS-182	.....	B65-10009	05
LANGLEY-10	.....	B63-10321	01	LEWIS-185	.....	B65-10101	05
LANGLEY-16	.....	B63-10557	03	LEWIS-190	.....	B65-10251	05
LANGLEY-20	.....	B63-10558	05	LEWIS-192	.....	B65-10150	05
LANGLEY-21	.....	B64-10119	05	LEWIS-193	.....	B65-10344	03
LANGLEY-23	.....	B63-10526	05	LEWIS-202	.....	B65-10188	02
LANGLEY-25	.....	B63-10528	03	LEWIS-208	.....	B65-10192	05
LANGLEY-26	.....	B63-10529	01	LEWIS-211	.....	B65-10117	03
LANGLEY-27	.....	B64-10130	05	LEWIS-212	.....	B65-10370	05
LANGLEY-28	.....	B63-10530	05	LEWIS-217	.....	B65-10302	03
LANGLEY-31	.....	B64-10237	01	LEWIS-219	.....	B65-10319	05
LANGLEY-32	.....	B65-10074	05	LEWIS-220	.....	B65-10338	05
LANGLEY-33	.....	B65-10100	02	LEWIS-222	.....	B65-10331	02
LANGLEY-34	.....	B65-10195	01	LEWIS-225	.....	B65-10270	03
LANGLEY-36	.....	B65-10114	05	LEWIS-232	.....	B65-10296	02
LANGLEY-37	.....	B65-10288	03	LEWIS-241	.....	B65-10304	01
LANGLEY-38	.....	B65-10231	05				
LANGLEY-39	.....	B65-10042	05	M-FS-1	.....	B63-10376	05
LANGLEY-40	.....	B64-10145	05	M-FS-3	.....	B63-10378	03
LANGLEY-44	.....	B64-10146	04	M-FS-12	.....	B63-10384	05
LANGLEY-45	.....	B64-10272	05	M-FS-13	.....	B63-10385	05
LANGLEY-46	.....	B65-10073	01	M-FS-14	.....	B65-10088	03
LANGLEY-47	.....	B65-10043	03	M-FS-15	.....	B63-10387	05
LANGLEY-48	.....	B65-10062	01	M-FS-17	.....	B63-10389	03
LANGLEY-49	.....	B65-10067	01	M-FS-25	.....	B65-10057	01
LANGLEY-54	.....	B65-10075	05	M-FS-32	.....	B64-10309	01
LANGLEY-55	.....	B65-10086	01	M-FS-37	.....	B64-10406	05
LANGLEY-62	.....	B65-10045	01	M-FS-48	.....	B65-10044	03
LANGLEY-80	.....	B65-10361	01	M-FS-54	.....	B63-10453	03
LANGLEY-87	.....	B65-10345	01	M-FS-61	.....	B63-10567	01
LANGLEY-88	.....	B65-10070	05	M-FS-64	.....	B63-10479	03
LANGLEY-90	.....	B65-10063	05	M-FS-67	.....	B63-10481	03
LANGLEY-92	.....	B65-10071	02	M-FS-69	.....	B63-10568	05
LANGLEY-93	.....	B65-10084	02	M-FS-81	.....	B65-10029	05
LANGLEY-95	.....	B65-10356	02	M-FS-84	.....	B63-10571	05
LANGLEY-96	.....	B65-10090	05	M-FS-86	.....	B63-10572	01
LANGLEY-99	.....	B65-10392	01	M-FS-91	.....	B63-10497	05
LANGLEY-104	.....	B65-10159	01	M-FS-98	.....	B63-10502	05
LANGLEY-115	.....	B65-10164	03	M-FS-105	.....	B65-10218	01
LANGLEY-116	.....	B65-10220	03	M-FS-122	.....	B63-10590	05
LANGLEY-121	.....	B65-10167	03	M-FS-123	.....	B63-10579	01
LANGLEY-123	.....	B65-10204	01	M-FS-145	.....	B64-10050	05
LANGLEY-129	.....	B65-10193	01	M-FS-150	.....	B65-10357	03
LANGLEY-130	.....	B65-10183	01	M-FS-154	.....	B65-10174	05
LANGLEY-133	.....	B65-10272	02	M-FS-160	.....	B64-10099	03
LANGLEY-134	.....	B65-10122	02	M-FS-166	.....	B65-10005	01
LANGLEY-145	.....	B65-10383	05	M-FS-171	.....	B65-10035	05
LANGLEY-166	.....	B65-10252	02	M-FS-174	.....	B64-10163	01
LANGLEY-180	.....	B65-10388	05	M-FS-175	.....	B64-10164	05
				M-FS-190	.....	B64-10249	05
LEWIS-8B	.....	B65-10115	05	M-FS-192	.....	B65-10006	01
LEWIS-12	.....	B63-10337	03	M-FS-193	.....	B65-10221	01
LEWIS-13	.....	B63-10338	01	M-FS-194	.....	B65-10180	05
LEWIS-15	.....	B63-10340	05	M-FS-197	.....	B64-10283	01
LEWIS-28	.....	B65-10027	05	M-FS-202	.....	B65-10106	03
LEWIS-37	.....	B64-10042	01	M-FS-207	.....	B65-10059	01
LEWIS-38	.....	B63-10341	05	M-FS-210	.....	B65-10014	05
LEWIS-39	.....	B63-10342	01	M-FS-214	.....	B65-10210	05
LEWIS-41	.....	B63-10344	02	M-FS-216	.....	B65-10078	05
LEWIS-42	.....	B63-10345	03	M-FS-219	.....	B64-10320	01
LEWIS-43	.....	B63-10346	02	M-FS-224	.....	B65-10039	05
LEWIS-47	.....	B63-10351	03	M-FS-227	.....	B65-10004	03
LEWIS-50	.....	B63-10354	05	M-FS-228	.....	B65-10019	05
LEWIS-64	.....	B63-10365	03	M-FS-230	.....	B65-10141	05
LEWIS-66	.....	B63-10367	05	M-FS-234	.....	B65-10047	01
LEWIS-67	.....	B63-10368	05	M-FS-235	.....	B65-10172	03
LEWIS-73	.....	B63-10440	01	M-FS-236	.....	B65-10107	03
LEWIS-75	.....	B63-10442	05	M-FS-238	.....	B65-10184	01
LEWIS-76	.....	B63-10443	01	M-FS-240	.....	B65-10133	02
LEWIS-99	.....	B64-10348	05	M-FS-245	.....	B65-10209	01
LEWIS-106	.....	B63-10489	05	M-FS-247	.....	B65-10080	01
LEWIS-108	.....	B65-10065	03	M-FS-249	.....	B65-10146	01
LEWIS-125	.....	B65-10202	01	M-FS-250	.....	B65-10169	01
LEWIS-126	.....	B65-10335	03	M-FS-253	.....	B65-10110	05
LEWIS-131	.....	B65-10262	05	M-FS-257	.....	B65-10129	02
LEWIS-136	.....	B65-10149	05	M-FS-267	.....	B65-10092	03
LEWIS-144	.....	B64-10116	03	M-FS-272	.....	B65-10140	03
LEWIS-152	.....	B64-10014	05	M-FS-274	.....	B65-10079	01
LEWIS-154	.....	B65-10032	03	M-FS-276	.....	B65-10290	01
LEWIS-155	.....	B65-10139	01	M-FS-279	.....	B65-10190	03

M-FS-280	.....	B65-10098	05	MSC-214	.....	B65-10389	01
M-FS-287	.....	B65-10342	05	MSC-216	.....	B65-10321	03
M-FS-289	.....	B65-10170	05	MSC-218	.....	B65-10322	01
M-FS-293	.....	B65-10346	05	MSC-231	.....	B65-10381	01
M-FS-297	.....	B65-10353	01	MSC-236	.....	B65-10358	05
M-FS-303	.....	B65-10177	05	MSC-237	.....	B65-10360	05
M-FS-308	.....	B65-10181	05	MSC-238	.....	B65-10375	05
M-FS-315	.....	B65-10215	01	MSC-241	.....	B65-10400	01
M-FS-320	.....	B65-10326	05	MSC-242	.....	B65-10399	01
M-FS-323	.....	B65-10377	01	MSC-243	.....	B65-10401	05
M-FS-331	.....	B65-10281	01	MSC-244	.....	B65-10385	05
M-FS-340	.....	B65-10219	05	MSC-253	.....	B65-10398	03
M-FS-348	.....	B65-10336	03	MSC-261	.....	B65-10376	01
M-FS-358	.....	B65-10285	05	MSC-282	.....	B65-10394	05
M-FS-362	.....	B65-10265	01				
M-FS-363	.....	B65-10269	01	NEO-13	.....	B65-10239	02
M-FS-365	.....	B65-10294	03				
M-FS-367	.....	B65-10279	01	NU-0001	.....	B65-10024	03
M-FS-371	.....	B65-10347	01	NU-0003	.....	B65-10038	05
M-FS-376	.....	B65-10349	01	NU-0005	.....	B65-10053	05
M-FS-380	.....	B65-10318	01	NU-0008	.....	B65-10245	05
M-FS-394	.....	B65-10391	05	NU-0009	.....	B65-10049	05
M-FS-415	.....	B65-10368	02	NU-0010	.....	B65-10050	01
M-FS-417	.....	B65-10382	01	NU-0011	.....	B65-10051	01
M-FS-476	.....	B65-10402	05	NU-0013	.....	B65-10077	05
M-FS-482	.....	B65-10395	02	NU-0015	.....	B65-10052	01
M-FS-485	.....	B65-10384	03	NU-0016	.....	B65-10160	05
				NU-0020	.....	B65-10254	05
MSC-4A	.....	B64-10001	05	NU-0022	.....	B65-10246	05
MSC-8	.....	B64-10141	05	NU-0023	.....	B65-10256	05
MSC-14	.....	B64-10024	01	NU-0024	.....	B65-10247	01
MSC-17	.....	B64-10025	04	NU-0025	.....	B65-10248	05
MSC-20	.....	B63-10493	01	NU-0029	.....	B65-10249	01
MSC-24	.....	B63-10519	05	NU-0030	.....	B65-10250	03
MSC-30	.....	B65-10022	05				
MSC-42	.....	B64-10058	05	WOO-4	.....	B63-10420	05
MSC-46	.....	B64-10185	05	WOO-5	.....	B63-10421	02
MSC-50	.....	B64-10108	04	WOO-029	.....	B65-10348	05
MSC-51	.....	B64-10109	01	WOO-041	.....	B64-10278	05
MSC-53	.....	B64-10015	05	WOO-046	.....	B65-10041	01
MSC-56	.....	B65-10016	03	WOO-048	.....	B64-10284	05
MSC-57	.....	B64-10016	01	WOO-054	.....	B64-10349	01
MSC-58	.....	B64-10017	01	WOO-055	.....	B63-10508	01
MSC-63A	.....	B64-10138	03	WOO-062	.....	B64-10019	01
MSC-64	.....	B64-10064	01	WOO-065	.....	B64-10021	05
MSC-72	.....	B64-10118	01	WOO-070	.....	B65-10303	03
MSC-80	.....	B65-10185	05	WOO-071	.....	B65-10179	03
MSC-85	.....	B64-10166	03	WOO-079	.....	B65-10289	01
MSC-89	.....	B64-10255	01	WOO-089	.....	B65-10372	03
MSC-92	.....	B64-10259	01	WOO-090	.....	B65-10363	01
MSC-93	.....	B64-10258	01	WOO-092	.....	B65-10008	05
MSC-94	.....	B65-10091	01	WOO-098	.....	B65-10386	05
MSC-95	.....	B65-10010	01	WOO-100	.....	B64-10270	03
MSC-100	.....	B65-10168	05	WOO-101	.....	B64-10271	01
MSC-102	.....	B65-10060	05	WOO-102	.....	B65-10371	05
MSC-103	.....	B65-10018	01	WOO-104	.....	B64-10282	03
MSC-106	.....	B65-10142	01	WOO-108	.....	B65-10031	05
MSC-107	.....	B65-10015	03	WOO-112	.....	B65-10064	05
MSC-108	.....	B65-10003	05	WOO-118	.....	B65-10111	05
MSC-112	.....	B65-10230	05	WOO-125	.....	B65-10182	01
MSC-118	.....	B64-10319	03	WOO-130	.....	B65-10323	05
MSC-121	.....	B65-10238	01	WOO-142	.....	B65-10227	05
MSC-122	.....	B65-10054	01	WOO-151	.....	B65-10341	03
MSC-125	.....	B65-10030	01	WOO-194	.....	B65-10379	01
MSC-127	.....	B65-10153	05	WOO-195	.....	B65-10266	05
MSC-130	.....	B65-10229	05	WOO-206	.....	B65-10380	01
MSC-133	.....	B65-10143	01	WOO-207	.....	B65-10387	01
MSC-134	.....	B65-10137	01	WOO-227	.....	B65-10367	05
MSC-135	.....	B65-10214	03	WOO-228	.....	B65-10378	05
MSC-137	.....	B65-10166	05	WOO-246	.....	B65-10374	03
MSC-139	.....	B65-10108	01	WOO-249	.....	B65-10397	03
MSC-140	.....	B65-10116	05				
MSC-142	.....	B65-10186	02	WS-4	.....	B64-10006	05
MSC-144	.....	B65-10095	03				
MSC-149	.....	B65-10135	05				
MSC-151	.....	B65-10161	01				
MSC-154	.....	B65-10201	05				
MSC-155	.....	B65-10263	01				
MSC-158	.....	B65-10320	01				
MSC-161	.....	B65-10240	02				
MSC-164	.....	B65-10196	01				
MSC-168	.....	B65-10241	05				
MSC-173	.....	B65-10396	01				
MSC-179	.....	B65-10268	01				
MSC-188	.....	B65-10350	01				
MSC-189	.....	B65-10352	01				
MSC-191	.....	B65-10365	01				
MSC-210	.....	B65-10390	03				

# TECH BRIEF/ORIGINATOR NUMBER INDEX

## Tech Brief/Originator Number Index

The left hand column identifies the Tech Brief number, e.g., B65-10023, followed by a two-digit number, e.g., 01, which identifies the subject category containing the entire citation. Following the subject category number is the originator number.

B63-10003	04	.....	ARC-2
B63-10004	03	.....	ARC-3
B63-10006	01	.....	ARC-5
B63-10007	05	.....	ARC-6
B63-10008	05	.....	ARC-7
B63-10009	05	.....	ARC-8
B63-10023	05	.....	FRC-16
B63-10024	01	.....	FRC-17
B63-10027	01	.....	GSFC-36
B63-10033	01	.....	GSFC-42
B63-10091	01	.....	JPL-63
B63-10118	01	.....	JPL-122
B63-10123	05	.....	JPL-135
B63-10139	05	.....	JPL-170
B63-10141	05	.....	JPL-179
B63-10143	05	.....	JPL-182
B63-10170	05	.....	JPL-231
B63-10174	01	.....	JPL-236A
B63-10193	01	.....	JPL-288
B63-10198	05	.....	JPL-303
B63-10200	05	.....	JPL-305
B63-10207	03	.....	JPL-321
B63-10226	05	.....	JPL-354
B63-10227	01	.....	JPL-357
B63-10228	05	.....	JPL-361
B63-10229	01	.....	JPL-362
B63-10234	03	.....	JPL-373
B63-10235	03	.....	JPL-374
B63-10236	05	.....	JPL-375
B63-10237	05	.....	JPL-376
B63-10238	01	.....	JPL-381
B63-10240	05	.....	JPL-384
B63-10241	05	.....	JPL-385
B63-10247	05	.....	JPL-392
B63-10250	01	.....	JPL-397
B63-10251	05	.....	JPL-398
B63-10255	01	.....	JPL-406
B63-10258	01	.....	JPL-410
B63-10260	02	.....	JPL-418
B63-10262	01	.....	JPL-421
B63-10263	03	.....	JPL-424
B63-10264	01	.....	JPL-425
B63-10280	01	.....	JPL-0021
B63-10284	01	.....	JPL-0029
B63-10289	05	.....	JPL-IT-1001
B63-10291	05	.....	JPL-IT-1003
B63-10292	05	.....	JPL-IT-1004
B63-10304	05	.....	LANGLEY-1A
B63-10311	03	.....	LANGLEY-4
B63-10318	03	.....	LANGLEY-6A
B63-10321	01	.....	LANGLEY-10
B63-10337	03	.....	LEWIS-12
B63-10338	01	.....	LEWIS-13
B63-10340	05	.....	LEWIS-15
B63-10341	05	.....	LEWIS-38
B63-10342	01	.....	LEWIS-39
B63-10344	02	.....	LEWIS-41
B63-10345	03	.....	LEWIS-42
B63-10346	02	.....	LEWIS-43
B63-10351	03	.....	LEWIS-47
B63-10354	05	.....	LEWIS-50
B63-10365	03	.....	LEWIS-64
B63-10367	05	.....	LEWIS-66
B63-10368	05	.....	LEWIS-67
B63-10376	05	.....	M-FS-1
B63-10378	03	.....	M-FS-3
B63-10384	05	.....	M-FS-12
B63-10385	05	.....	M-FS-13
B63-10387	05	.....	M-FS-15
B63-10389	03	.....	M-FS-17
B63-10420	05	.....	WOO-4
B63-10421	02	.....	WOO-5
B63-10424	03	.....	JPL-WOO-008
B63-10429	03	.....	ARC-11
B63-10431	05	.....	ARC-13
B63-10435	05	.....	ARC-17
B63-10440	01	.....	LEWIS-73
B63-10442	05	.....	LEWIS-75
B63-10443	01	.....	LEWIS-76
B63-10453	03	.....	M-FS-54
B63-10476	03	.....	GSFC-67
B63-10479	03	.....	M-FS-64
B63-10481	03	.....	M-FS-67
B63-10489	05	.....	LEWIS-106
B63-10493	01	.....	MSC-20
B63-10497	05	.....	M-FS-91
B63-10502	05	.....	M-FS-98
B63-10508	01	.....	WOO-055
B63-10511	01	.....	GSFC-80
B63-10512	01	.....	GSFC-85
B63-10514	01	.....	JPL-513
B63-10517	05	.....	JPL-545
B63-10519	05	.....	MSC-24
B63-10526	05	.....	LANGLEY-23
B63-10528	03	.....	LANGLEY-25
B63-10529	01	.....	LANGLEY-26
B63-10530	05	.....	LANGLEY-28
B63-10536	01	.....	GSFC-91
B63-10537	01	.....	JPL-WOO-029
B63-10546	03	.....	GSFC-82
B63-10547	05	.....	GSFC-92
B63-10551	01	.....	GSFC-100
B63-10553	01	.....	GSFC-111
B63-10554	01	.....	GSFC-112
B63-10555	01	.....	GSFC-113
B63-10556	05	.....	GSFC-115
B63-10557	03	.....	LANGLEY-16
B63-10558	05	.....	LANGLEY-20
B63-10560	05	.....	ARC-20
B63-10561	01	.....	ARC-22
B63-10562	03	.....	ARC-23
B63-10564	05	.....	ARC-25
B63-10567	01	.....	M-FS-61
B63-10568	05	.....	M-FS-69
B63-10571	05	.....	M-FS-84
B63-10572	01	.....	M-FS-86
B63-10579	01	.....	M-FS-123
B63-10590	05	.....	M-FS-122
B63-10596	01	.....	GSFC-93
B63-10597	01	.....	GSFC-114
B63-10599	01	.....	GSFC-119
B63-10600	01	.....	GSFC-120
B63-10603	01	.....	GSFC-132
B63-10606	01	.....	GSFC-129

B63-10609	01	GSFC-137
B63-10612	03	JPL-544
B63-10613	01	JPL-559
B64-10001	05	MSC-4A
B64-10002	01	JPL-447
B64-10004	01	ARC-26
B64-10006	05	WS-4
B64-10007	01	GSFC-48
B64-10010	01	GSFC-150
B64-10011	05	GSFC-151
B64-10014	05	LEWIS-152
B64-10015	05	MSC-53
B64-10016	01	MSC-57
B64-10017	01	MSC-58
B64-10019	01	WOO-062
B64-10021	05	WOO-065
B64-10024	01	MSC-14
B64-10025	04	MSC-17
B64-10028	05	GSFC-143
B64-10031	05	JPL-555
B64-10042	01	LEWIS-37
B64-10050	05	M-FS-145
B64-10058	05	MSC-42
B64-10064	01	MSC-64
B64-10065	01	JPL-596
B64-10066	05	JPL-484
B64-10068	03	ARC-28
B64-10069	05	ARC-29
B64-10080	01	JPL-358
B64-10084	05	JPL-584
B64-10099	03	M-FS-160
B64-10108	04	MSC-50
B64-10109	01	MSC-51
B64-10113	03	GSFC-168
B64-10114	01	GSFC-169
B64-10116	03	LEWIS-144
B64-10118	01	MSC-72
B64-10119	05	LANGLEY-21
B64-10121	05	GSFC-59
B64-10122	01	JPL-466
B64-10124	05	JPL-499
B64-10130	03	LANGLEY-27
B64-10138	05	MSC-63A
B64-10141	05	MSC-8
B64-10142	03	GSFC-161
B64-10143	01	ARC-36
B64-10144	01	GSFC-101
B64-10145	05	LANGLEY-40
B64-10146	04	LANGLEY-44
B64-10150	01	GSFC-187
B64-10151	03	GSFC-188
B64-10158	01	JPL-628
B64-10163	01	M-FS-174
B64-10164	05	M-FS-175
B64-10166	03	MSC-85
B64-10170	05	LEWIS-159
B64-10171	01	ARC-39
B64-10173	01	GSFC-73
B64-10178	05	JPL-604
B64-10185	05	MSC-46
B64-10188	05	JPL-585
B64-10200	01	GSFC-190
B64-10206	03	JPL-611
B64-10209	01	GSFC-200
B64-10211	05	GSFC-206
B64-10222	01	JPL-472
B64-10223	05	JPL-478
B64-10226	01	JPL-486
B64-10237	01	LANGLEY-31
B64-10249	05	M-FS-190
B64-10255	01	MSC-89
B64-10258	01	MSC-93
B64-10259	01	MSC-92
B64-10270	03	WOO-100
B64-10271	01	WOG-101
B64-10272	05	LANGLEY-45
B64-10274	05	WOO-005
B64-10277	05	GSFC-234
B64-10278	05	WOO-041
B64-10280	01	JPL-504
B64-10281	01	GSFC-236
B64-10282	03	WOO-104
B64-10283	01	M-FS-197
B64-10284	05	WOO-048
B64-10299	01	GSFC-251
B64-10305	01	GSFC-238
B64-10306	05	JPL-0036

B64-10309	01	M-FS-32
B64-10319	03	MSC-118
B64-10320	01	M-FS-219
B64-10327	05	GSFC-253
B64-10330	01	JPL-SC-065
B64-10348	05	LEWIS-99
B64-10349	01	WOO-054
B64-10406	05	M-FS-37
B65-10001	01	GSFC-227
B65-10002	01	GSFC-241
B65-10003	05	MSC-108
B65-10004	03	M-FS-227
B65-10005	01	M-FS-166
B65-10006	01	M-FS-192
B65-10007	05	JPL-SC-066
B65-10008	05	WOO-092
B65-10009	05	LEWIS-182
B65-10010	01	MSC-95
B65-10011	01	GSFC-34A
B65-10012	01	GSFC-243
B65-10013	01	JPL-33
B65-10014	05	M-FS-210
B65-10015	03	MSC-107
B65-10016	03	MSC-56
B65-10017	05	GSFC-237
B65-10018	01	MSC-103
B65-10019	05	M-FS-228
B65-10020	05	JPL-SC-064
B65-10021	05	LEWIS-158
B65-10022	05	MSC-30
B65-10023	01	JPL-591
B65-10024	03	NU-0001
B65-10025	01	JPL-SC-069
B65-10026	01	GSFC-198
B65-10027	05	LEWIS-28
B65-10028	01	GSFC-228
B65-10029	05	M-FS-81
B65-10030	01	MSC-125
B65-10031	05	WOO-108
B65-10032	03	LEWIS-154
B65-10033	01	JPL-SC-068
B65-10034	03	JPL-SC-071
B65-10035	05	M-FS-171
B65-10036	02	JPL-304
B65-10037	05	JPL-463
B65-10038	05	NU-0003
B65-10039	05	M-FS-224
B65-10040	05	JPL-442
B65-10041	01	WOO-046
B65-10042	05	LANGLEY-39
B65-10043	03	LANGLEY-47
B65-10044	03	M-FS-48
B65-10045	01	LANGLEY-62
B65-10046	02	JPL-SC-055
B65-10047	01	M-FS-234
B65-10048	01	GSFC-252
B65-10049	05	NU-0009
B65-10050	01	NU-0010
B65-10051	01	NU-0011
B65-10052	01	NU-0015
B65-10053	05	NU-0005
B65-10054	01	MSC-122
B65-10055	01	JPL-82
B65-10056	01	ARC-38
B65-10057	01	M-FS-25
B65-10059	01	M-FS-207
B65-10060	05	MSC-102
B65-10061	01	JPL-638
B65-10062	01	LANGLEY-48
B65-10063	05	LANGLEY-90
B65-10064	05	WOO-112
B65-10065	03	LEWIS-108
B65-10066	01	JPL-SC-072
B65-10067	01	LANGLEY-49
B65-10068	01	JPL-655
B65-10069	01	GSFC-261
B65-10070	05	LANGLEY-88
B65-10071	02	LANGLEY-92
B65-10072	01	GSFC-274
B65-10073	01	LANGLEY-46
B65-10074	05	LANGLEY-32
B65-10075	05	LANGLEY-54
B65-10076	01	GSFC-240
B65-10077	05	NU-0013
B65-10078	05	M-FS-216
B65-10079	01	M-FS-274
B65-10080	01	M-FS-247
B65-10081	02	GSFC-294

B65-10082	02	GSFC-286
B65-10083	03	GSFC-295
B65-10084	02	LANGLEY-93
B65-10085	01	ARC-37
B65-10086	01	LANGLEY-55
B65-10087	01	GSFC-280
B65-10088	03	M-FS-14
B65-10089	01	ARC-27
B65-10090	05	LANGLEY-96
B65-10091	01	MSC-94
B65-10092	03	M-FS-267
B65-10093	01	GSFC-306
B65-10094	05	MSC-40
B65-10095	03	MSC-144
B65-10096	01	GSFC-287
B65-10097	01	GSFC-262
B65-10098	05	M-FS-280
B65-10099	05	JPL-264
B65-10100	02	LANGLEY-33
B65-10101	05	LEWIS-185
B65-10102	01	GSFC-267
B65-10103	01	GSFC-249
B65-10104	05	JPL-480
B65-10105	01	GSFC-291
B65-10106	03	M-FS-202
B65-10107	03	M-FS-236
B65-10108	01	MSC-139
B65-10109	05	JPL-WOO-031
B65-10110	05	M-FS-253
B65-10111	05	WOO-118
B65-10112	01	JPL-WOO-010
B65-10113	05	JPL-631
B65-10114	05	LANGLEY-36
B65-10115	05	LEWIS-8B
B65-10116	05	MSC-140
B65-10117	03	LEWIS-211
B65-10118	01	GSFC-196
B65-10119	01	GSFC-183
B65-10120	01	ARC-42
B65-10121	05	JPL-WOO-039
B65-10122	02	LANGLEY-134
B65-10123	01	GSFC-289
B65-10124	01	GSFC-AE-21
B65-10125	01	JPL-413
B65-10126	05	GSFC-265
B65-10127	01	GSFC-299
B65-10128	01	JPL-675
B65-10129	02	M-FS-257
B65-10130	05	JPL-198
B65-10131	05	LEWIS-174
B65-10132	02	JPL-508
B65-10133	02	M-FS-240
B65-10134	05	GSFC-319
B65-10135	05	MSC-149
B65-10136	03	GSFC-281
B65-10137	01	MSC-134
B65-10138	01	GSFC-272
B65-10139	01	LEWIS-155
B65-10140	03	M-FS-272
B65-10141	05	M-FS-230
B65-10142	01	MSC-106
B65-10143	01	MSC-133
B65-10144	05	JPL-661
B65-10145	01	JPL-509
B65-10146	01	M-FS-249
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B65-10148	05	GSFC-335
B65-10149	05	LEWIS-136
B65-10150	05	LEWIS-192
B65-10151	01	GSFC-315
B65-10152	01	GSFC-257
B65-10153	05	MSC-127
B65-10154	05	LEWIS-170
B65-10156	03	GSFC-366
B65-10157	02	LEWIS-171
B65-10158	01	GSFC-293
B65-10159	01	LANGLEY-104
B65-10160	05	NU-0016
B65-10161	01	MSC-151
B65-10162	03	GSFC-284
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B65-10164	03	LANGLEY-115
B65-10165	01	GSFC-292
B65-10166	05	MSC-137
B65-10167	03	LANGLEY-121
B65-10168	05	MSC-100
B65-10169	01	M-FS-250
B65-10170	05	M-FS-289

B65-10171	02	GSFC-231
B65-10172	03	M-FS-235
B65-10173	03	GSFC-320
B65-10174	05	M-FS-154
B65-10175	03	JPL-WOO-021
B65-10176	05	GSFC-49
B65-10177	05	M-FS-303
B65-10178	01	GSFC-130
B65-10179	03	WOO-071
B65-10180	05	M-FS-194
B65-10181	05	M-FS-308
B65-10182	01	WOO-125
B65-10183	01	LANGLEY-130
B65-10184	01	M-FS-238
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B65-10188	02	LEWIS-202
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B65-10192	05	LEWIS-208
B65-10193	01	LANGLEY-129
B65-10194	01	GSFC-246
B65-10195	01	LANGLEY-34
B65-10196	01	MSC-164
B65-10197	01	JPL-SC-060
B65-10198	05	FRC-21
B65-10199	01	GSFC-339
B65-10200	01	GSFC-322
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B65-10202	01	LEWIS-125
B65-10203	01	ARC-41
B65-10204	01	LANGLEY-123
B65-10205	05	JPL-658
B65-10206	01	GSFC-288
B65-10207	05	JPL-0019
B65-10208	01	ARC-34
B65-10209	01	M-FS-245
B65-10210	05	M-FS-214
B65-10211	02	GSFC-171
B65-10212	01	GSFC-310
B65-10213	01	GSFC-329
B65-10214	03	MSC-135
B65-10215	01	M-FS-315
B65-10216	05	GSFC-347
B65-10217	03	GSFC-352
B65-10218	01	M-FS-105
B65-10219	05	M-FS-340
B65-10220	03	LANGLEY-116
B65-10221	01	M-FS-193
B65-10222	05	JPL-2A
B65-10223	01	JPL-510
B65-10224	02	GSFC-356
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B65-10226	01	GSFC-340
B65-10227	05	WOO-142
B65-10228	01	GSFC-285
B65-10229	05	MSC-130
B65-10230	05	MSC-112
B65-10231	05	LANGLEY-38
B65-10232	01	JPL-500
B65-10233	01	JPL-SC-073
B65-10234	01	GSFC-314
B65-10235	05	HQ-20
B65-10236	05	JPL-687
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B65-10238	01	MSC-121
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B65-10240	02	MSC-161
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B65-10242	01	GSFC-350
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B65-10244	01	JPL-720
B65-10245	05	NU-0008
B65-10246	05	NU-0022
B65-10247	01	NU-0024
B65-10248	05	NU-0025
B65-10249	01	NU-0029
B65-10250	03	NU-0030
B65-10251	05	LEWIS-190
B65-10252	02	LANGLEY-166
B65-10253	02	GSFC-353
B65-10254	05	NU-0020
B65-10255	01	LEWIS-178
B65-10256	05	NU-0023
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B65-10258	01	GSFC-370

B65-10259	01	GSFC-387
B65-10260	01	GSFC-391
B65-10261	03	HQ-24
B65-10262	05	LEWIS-131
B65-10263	01	MSC-155
B65-10264	01	FRC-31
B65-10265	01	M-FS-362
B65-10266	05	WOO-195
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B65-10269	01	M-FS-363
B65-10270	03	LEWIS-225
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B65-10272	02	LANGLEY-133
B65-10273	01	GSFC-357
B65-10274	01	GSFC-363
B65-10275	01	JPL-698
B65-10276	01	GSFC-354
B65-10277	01	ARC-46
B65-10278	01	GSFC-386
B65-10279	01	M-FS-367
B65-10280	02	LEWIS-160
B65-10281	01	M-FS-331
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B65-10284	01	GSFC-351
B65-10285	05	M-FS-358
B65-10286	01	HQ-12
B65-10287	01	GSFC-360
B65-10288	03	LANGLEY-37
B65-10289	01	WOO-079
B65-10290	01	M-FS-276
B65-10291	02	JPL-694
B65-10292	02	JPL-704
B65-10293	01	JPL-771
B65-10294	03	M-FS-365
B65-10295	02	JPL-725
B65-10296	02	LEWIS-232
B65-10297	02	JPL-627
B65-10298	01	GSFC-394
B65-10299	01	ARC-44
B65-10300	01	GSFC-397
B65-10301	01	FRC-28
B65-10302	03	LEWIS-217
B65-10303	03	WOO-070
B65-10304	01	LEWIS-241
B65-10305	01	GSFC-380
B65-10306	01	HQ-7
B65-10307	01	GSFC-268
B65-10308	01	GSFC-203
B65-10309	01	GSFC-346
B65-10310	01	GSFC-383
B65-10311	01	GSFC-375
B65-10312	05	LEWIS-163
B65-10313	01	HQ-1
B65-10314	01	GSFC-382
B65-10315	01	GSFC-395
B65-10316	03	ARC-47
B65-10317	01	JPL-SC-078
B65-10318	01	M-FS-380
B65-10319	05	LEWIS-219
B65-10320	01	MSC-158
B65-10321	03	MSC-216
B65-10322	01	MSC-218
B65-10323	05	WOO-130
B65-10324	01	JPL-SC-101
B65-10325	01	ARC-53
B65-10326	05	M-FS-320
B65-10327	05	GSFC-441
B65-10328	01	GSFC-442
B65-10329	01	GSFC-440
B65-10330	02	GSFC-443
B65-10331	02	LEWIS-222
B65-10332	04	HQ-18
B65-10333	01	GSFC-377
B65-10334	01	GSFC-308
B65-10335	03	LEWIS-126
B65-10336	03	M-FS-348
B65-10337	03	GSFC-444
B65-10338	05	LEWIS-220
B65-10339	05	GSFC-409
B65-10340	01	JPL-155
B65-10341	03	WOO-151
B65-10342	05	M-FS-287
B65-10343	01	GSFC-398
B65-10344	03	LEWIS-193
B65-10345	01	LANGLEY-87
B65-10346	05	M-FS-293

B65-10347	01	M-FS-371
B65-10348	05	WOO-029
B65-10349	01	M-FS-376
B65-10350	01	MSC-188
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B65-10352	01	MSC-189
B65-10353	01	M-FS-297
B65-10354	03	JPL-SC-083
B65-10355	01	GSFC-399
B65-10356	02	LANGLEY-95
B65-10357	03	M-FS-150
B65-10358	05	MSC-236
B65-10359	01	JPL-SC-167
B65-10360	05	MSC-237
B65-10361	01	LANGLEY-80
B65-10362	01	GSFC-446
B65-10363	01	WOO-090
B65-10364	03	GSFC-388
B65-10365	01	MSC-191
B65-10366	03	JPL-SC-079
B65-10367	05	WOO-227
B65-10368	02	M-FS-415
B65-10369	01	ARC-1
B65-10370	05	LEWIS-212
B65-10371	05	WOO-102
B65-10372	03	WOO-089
B65-10373	02	GSFC-424
B65-10374	03	WOO-246
B65-10375	05	MSC-238
B65-10376	01	MSC-261
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B65-10378	05	WOO-228
B65-10379	01	WOO-194
B65-10380	01	WOO-206
B65-10381	01	MSC-231
B65-10382	01	M-FS-417
B65-10383	05	LANGLEY-145
B65-10384	03	M-FS-485
B65-10385	05	MSC-244
B65-10386	05	WOO-098
B65-10387	01	WOO-207
B65-10388	05	LANGLEY-180
B65-10389	01	MSC-214
B65-10390	03	MSC-210
B65-10391	05	M-FS-394
B65-10392	01	LANGLEY-99
B65-10393	05	JPL-SC-135
B65-10394	05	MSC-282
B65-10395	02	M-FS-482
B65-10396	01	MSC-173
B65-10397	03	WOO-249
B65-10398	03	MSC-253
B65-10399	01	MSC-242
B65-10400	01	MSC-241
B65-10401	05	MSC-243
B65-10402	05	M-FS-476